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REPURPOSING AGRICULTURAL SUPPORT POLICIES FOR SUSTAINABLE FOOD SYSTEMS

TOOLKIT

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ABBREVIATIONS

ACF	Advocacy Coalition Framework
ACG	Access Costs Gap
AgPER	Agricultural Public Expenditure Reviews
AOA	Angolan Kwanza
CAADP	Comprehensive Africa Agriculture Development Programme
CGE	Computable General Equilibrium
CIF	Cost, Insurance, and Freight
COFOG	Classification of the Functions of Government
COP	Conference of the Parties
DFID	Department for International Development
EPA	Everyday Political Economy Analysis
FAPDA	Food and Agriculture Policy Decision Analysis
FCDO	Foreign, Commonwealth, and Development Office
FCFA	West African CFA franc or Central African CFA franc
FOB	Free on Board
GDP	Gross Domestic Product
GFFA	Global Forum for Food and Agriculture
GHG	Greenhouse Gas
GSSE	General Services Support Estimate
IFPRI	International Food Policy Research Institute
IMF	International Monetary Fund
LC	Local Currency
MAFAP	Monitoring and Analyzing Food and Agricultural Policies
MDG	Market Development Gap
METASIP	Medium-Term Agricultural Sector Investment Plan
MPS	Market Price Support
MSF	Multiple Streams Framework
NCSB	Non-Calorically Sweetened Beverages
NGO	Non-Governmental Organizations
NRA	Nominal rate of assistance
NRP	Nominal rate of protection
OECD	Organization for Economic Co-operation and Development
PE	Public Expenditure
PEA	Public Expenditure Analysis
PG	Price Gap
PI	Price Incentives
PoC	Point of Competition
PNISA	The National Programme for Investment in the Agriculture Sector
PSE	Producer Support Estimate
R&D	Research and Development
RCT	Randomized Control Trials
RENAPRI	Regional Network of Agricultural Policy Research Institutes
RP	Reference Price
ReSAKSS	The Regional Strategic Analysis and Knowledge Support System
SAPAA	Suivi et Analyze des Politiques Agricoles et Alimentaires
SDG	Sustainable Development Goals
TWP	Thinking and Working Politically
UIF	Urban Institute Framework

UNFSS	United Nations Food Systems Summit
WDI	World Development Indicators
WHO	World Health Organization
WTO	World Trade Organization

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GLOSSARY

Agricultural policy support is defined as the annual monetary value of gross transfers to agriculture from consumers and taxpayers arising from government policies, programs, and interventions that support agriculture, regardless of their objectives and economic impacts. The support provided to agriculture through public policies, programs, and interventions aimed at addressing "a wide range of issues, from assisting farmers to achieve adequate incomes to providing sufficient food at reasonable prices for consumers, and from improving the sector's resilience to weather, market or other shocks to ensuring food safety and improving the environmental performance" (OECD n.d.-a).

Agrifood system transformation: A holistic approach adapted to local needs and territories that can facilitate a transition to agrifood systems that are more productive, sustainable, and climate-resilient, thus in line with actions needed to accomplish the SDGs. In this way, we could preserve and protect the environment and biodiversity to maintain a natural buffer against diseases while promoting decent livelihoods for farmers and contributing to economic revival (FAO 2021a).

Agrifood systems encompass the entire range of actors and their interlinked value-adding activities, engaged in the primary production of food and non-food agricultural products, as well as in storage, aggregation, post-harvest handling, transportation, processing, distribution, marketing, disposal, and consumption of all food products including those of non-agricultural origin (FAO 2021b).

Coupled subsidies are fiscal subsidies (budget transfers) to producers tied to the production of a specific commodity, the use of variable inputs, or specific factors of production (e.g., area planted or animal numbers). Decoupled subsidies are, on the other hand, transfers to producers not tied to specific production requirements of commodities, use or inputs, or other criteria, as mentioned before (FAO et al. 2022).

Econometric methods are economic analysis methods that use statistics and mathematics to test economic theoretical models with quantitative data and assess the different effects of economic phenomena (Ouliaris 2011).

Fiscal subsidies are budget transfers (or direct payments) made by governments in the context of policy measures, projects, and programs to farmers (fiscal subsidies to producers), consumers (fiscal subsidies to consumers), or other individual agents of the agrifood sector. Fiscal subsidies to producers aim to reduce production costs or increase farm income and can be granted depending on output, input use, or use of other factors of production (FAO et al. 2022).

General services support consists of public expenditure (or budget transfers) for providing public or collective goods and services to agents of the agrifood sector (FAO et al. 2022).

Impact evaluation assesses how interventions affect outcomes and whether these effects are intended or unintended. The proper impact analysis requires a counterfactual of those outcomes without the intervention (OECD n.d.-b).

Market development gap is an aggregate estimate of the effect of the excessive access costs within a given value chain on the producer price of a given agricultural commodity (FAO 2015a).

Market distortions refer to any interference that affects prices and shifts market behavior, such as risk-taking and asset allocation (Kenton 2021).

Nominal rate of assistance is an indicator that measures policy support provided to farmers individually, both in the form of price incentives generated by trade and market policies (quantified by the nominal rate of protection) and by fiscal subsidies provided to producers of a specific commodity (FAO et al. 2022).

Nominal rate of protection is an indicator used to estimate price incentives provided to agricultural producers that measure the extent to which trade and market policies raise or lower the producer price of a commodity above or below the international reference price. As such, it measures how such policies incentivize (i.e., protect) or disincentivize (i.e., penalize) producers (FAO et al. 2022).

Policy coherence is the systematic promotion of mutually reinforcing policy actions across government departments and agencies, creating synergies toward achieving the agreed objectives (OECD 2005).

Policy instruments represent the linkage between policy formulation and implementation and are government authorities' governing tools to promote certain policies to achieve a predefined set of goals (Hettiarachchi & Kshourad 2019).

Policy monitoring in agriculture is the systematic production of policy-relevant indicators and analysis that allows one to take stock and review trends of agricultural policies in view of supporting a more effective design, implementation, and delivery of public policies and services based on sound evidence (OECD n.d.-c).

Political economy is the study of how politics affects the economy, and the economy, in turn, shapes politics, a discipline that uses the tools of economics to study politics (Frieden 2020).

Price incentives (or price support): are the result of trade and market measures on prices at the domestic level; for instance, import tariffs and quotas or minimum farm gate prices increase the domestic producer price compared to an international reference price.

Public expenditure on agriculture is allocated and/or disbursed by the public sector entities to finance the provision of services and goods in the agricultural sector (ECLAC n.d.).

Qualitative methods are analytical approaches that envisage collecting and analyzing non-numerical data to understand concepts, opinions or experiences." The most used qualitative methods include observations, interviews, focus groups, and surveys (Bhandari 2020).

Quantitative methods are analytical approaches that envisage collecting and analyzing numerical data to find trends, patterns, averages, dispersions, etc. Quantitative research methods include experiments and surveys and can be used in descriptive, correlational, and experimental research (Bhandari 2020).

Repurposing agricultural policy support entails the phasing out the most distorting and environmentally and socially harmful producer support (i.e., price incentives and fiscal subsidies tied to the production of a specific commodity), and resources are redirected toward investments for the provision of public goods and services for agriculture (i.e., research and development and infrastructure) and to decoupled fiscal subsidies (FAO, UNDP, & UNEP 2021).

Simulation-based modeling methods involve designing a model of a real-world or anticipated system, such as a design concept, then conducting experiments with the model to understand the system's

performance under different operating conditions and evaluate alternative management strategies and decision-making processes (Yin & McKay 2018).

INTRODUCTION

The global agrifood system[1] can no longer deliver the 'triple wins' of a healthy planet, healthy people, and healthy economies. The current system is associated with high 'hidden costs' and urgently needs transformation to provide better livelihoods, raise farm productivity, and become more sustainable, equitable, resilient, and healthy (COP27, GFFA, & UNFSS 2021). Achieving such transformative change requires a systemic shift in how the agrifood system are supported. We need to recognize that hundreds of millions of atomistic and rational economic decision-makers make up the agrifood system. Actors on the farm and along food value chains respond to economic incentives, and a core priority for food system transformation should be ensuring that economic agents receive appropriate incentives to guide meaningful change.

Among other factors, public support provided to the agrifood systems through public policies and expenditures shapes economic incentives for actors. However, evidence suggests that, in its current form, this support is misaligned with the `triple wins' agenda. Globally, agriculture receives over US$600 billion in support annually through public policies and expenditures, yet much of this support is poorly targeted and inefficiently used. In many countries, the bulk of this support is regressive and distortionary, discouraging producers from making sustainable and cost-effective decisions. Policies mostly favor a small set of livestock and cereal crops through distortive price support measures and direct payments to producers, often coupled with production decisions such as output and input subsidies. Doing so drives unsustainable production practices, inequality, and unhealthy consumption patterns (FAO, UNDP, & UNEP 2021). Agrifood systems drive one-third of global GHG emissions and are the main drivers of biodiversity loss and freshwater use and contamination. Continuing business as usual (BAU) will increase the vulnerability of the agrifood systems, as climate change, deforestation, and land degradation negatively impact agricultural productivity and increase the escalating risk of climate-related shocks. Moreover, current support delivers low value for money; for every US$1 of public support, only 35 cents reach farmers (Gautam et al. 2022), highlighting opportunities to improve government spending efficiency.

Studies show that agrifood system transformation has the potential to bring climate change under control, increase biological diversity, ensure healthier diets, and create new business opportunities worth up to US$4.5 trillion a year (FOLU 2019). Building better systems requires tackling multiple distortions, including the complex agriculture-energy nexus. Energy is a key input to the agrifood system as fossil fuels and electricity are used directly in agriculture production to operate machinery, power water pumps, manufacture fertilizers, cool or dry crops and livestock products, and fuel transport. Subsidies for both fossil fuels and energy, which is also generated from fossil fuel in most countries, increase the environmental footprint of the food system as they encourage overuse and waste at the cost of other economic activities. For example, fuel and electricity subsidies in India are reducing the marginal cost of pumping for farmers and incentivizing over pumping and a rapid depletion of groundwater resources. Wasteful overuse of cheap energy in agriculture also has a large opportunity cost in terms of foregone economic activity in other sectors, including the development of downstream processing and value addition activities in agri-food supply chains themselves. Finally, energy subsidies undermine the competitiveness of alternative types of energy (such as renewable energy) and efficient energy technologies such as solar energy, with negative long-term impacts on the environment.

[1] Agrifood systems encompass the entire range of actors, and their interlinked value-adding activities, engaged in the primary production of food and non-food agricultural products, as well as in storage, aggregation, post-harvest handling, transportation, processing, distribution, marketing, disposal and consumption of all food products including those of non-agricultural origin (FAO).

Repurposing these distortive agricultural policy support towards policy measures that promote increased efficiency, increased resilience, and enhanced positive environmental impacts offers an opportunity to accelerate the transformation towards environmentally sustainable agrifood systems.

What is meant by repurposing policies and public support? First and foremost, repurposing does not mean removing the much-needed support to the agrifood systems and redirecting it to activities outside of it. In fact, most developing countries currently provide insufficient support for developing sustainable and resilient agrifood systems. While far more support is needed through new pro-sustainable development measures, it is equally critical that governments use the current resources more effectively and efficiently. Therefore, this publication focuses on repurposing the existing agricultural support policies to align them with the objective of sustainability, productivity, and resilience to achieve a successful transformation of agrifood systems. Repurposing agrifood policies entails ''changing agrifood policies and public expenditures in such a way that they are better aligned with sustainability goals'' (Birner 2021). Such goals are enshrined in the global Sustainable Development Goals (SDGs) and integrated into numerous regional and national policy documents. The goals converge toward global food systems with lower environmental degradation and climate change impacts, more positive food and nutrition security outcomes, and more resilient, inclusive, and equitable outcomes.

Policymakers face the core question of how to practically repurpose agricultural policy support provided to the agrifood system. Repurposing presents a complex and multi-faceted challenge, with potentially non-trivial trade-offs, as it can alter incentives for *what* producers produce, *how much* they produce, *where* production occurs, and the technology employed. Analysts must address these trade-offs based on their specific socioeconomic, agroecological, and political contexts, as no single panacea can be universally implemented. As such, the toolkit aims to practically guide practitioners, policymakers, and their development partners in repurposing support. This is a living document, which could be later updated as more knowledge and information relevant for repurposing become available.

Repurposing Agricultural Support

Repurposing agricultural policies and support is an opportunity to transform the agrifood system and help achieve goals of environmental sustainability, inclusion, improved nutrition, and resilience (FAO, UNEP, & UNDP 2021; Gautam et al. 2022; FAO, IFAD, UNICEF, WFP, & WHO 2022). Even though repurposing is an agrifood system agenda, the primary focus of this document is on agricultural policy support that creates supply-side distortions and impede the development of robust and efficient agri-food value chains, generate harmful externalities, and waste critical resources such as water and energy at the farmgate level. While agricultural policy support also includes support provided to consumers (e.g., food aid and subsidies) and intermediary agents of the value chain (e.g., payments to input suppliers or traders), the focus of this toolkit, especially of Modules 2 and 3, is on direct support to agricultural producers and general support that enables agricultural production. This is because most of the support to the agrifood sector is provided to farmers, as discussed in the next section. The focus on farmers is also because most environmental impacts emerge at the farm level, and it is where the basis for dietary diversity starts. At the farm level, poverty and equity considerations become more relevant, given that most people experiencing poverty are engaged in agricultural production activities. Therefore, for this toolkit, we use the FAO, UNEP, and UNDP (2021) definition for repurposing agricultural support: *"…reduction in agricultural producer support measures that are inefficient, unsustainable and/or inequitable in order to replace them with support measures that are the opposite."*

A recently released report used global dynamic general equilibrium modeling to simulate how various production support repurposing options could contribute to achieving the triple wins (Gautam et al.

2022). Their results show that there are significant trade-offs depending on the option simulated. For example, simply removing all producer subsidies would help reduce emissions but would also negatively impact poverty, nutrition, and farmers' incomes. Instead, redirecting a portion of government spending toward investments in green technology can help increase GDP and volume of agricultural production, decrease poverty and prices of healthy foods, and reduce emissions and agricultural land usage simultaneously.

There is no silver bullet to repurposing: every country's context is unique, with its own challenges and objectives. Several countries have moved away from coupled subsidies to production as they realize that while input and output increase production, they do so at a large environmental cost. As a result, these countries have started to reform such support to be linked with environmental outcomes. Other countries have phased out price support for specific commodities as it was leading to overproduction and depressing domestic prices while damaging the environment. On the other hand, some countries are changing the implementation of the same support measures to make them more efficient and reduce the fiscal burden of these programs, which is becoming unmanageable.

The trade-offs of policy and reform options are specific to each country's socioeconomic, political, and agroecological realities. What may be optimal from a country's point of view might be suboptimal for other countries, against global objectives, or vice versa. This is particularly true for global public goods such as addressing climate change and greening agriculture. Such public goods transcend borders and national policies and can have a strong international spillover effect, especially for large producer countries. Therefore, international coordination is vital, and policymakers should work together[2]. Moreover, there is much value in learning from the experience of peer countries and understanding the motivation for their repurposing actions. That being said, policy change is essentially a national prerogative and happens at the country level. Importantly, the political economy of a country plays a key role in determining policy reforms. Hence, this toolkit also provides guidance on conducting political economy and social analysis, including stakeholder mapping and consultation, to develop strategies to secure stakeholder support and identify politically feasible repurposing options at the country level.

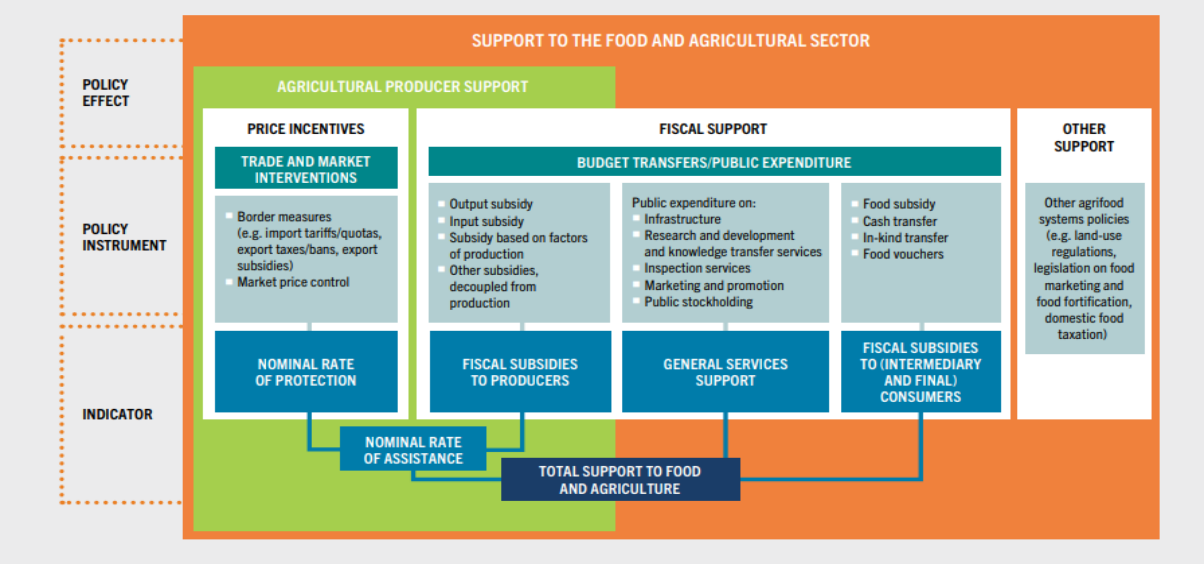
Classifying a Wide Range of Policies

Before governments can repurpose agricultural support policies, they must know what type and level of support is in place. Governments use many policy instruments to intervene in the agriculture sector. Figure I.1 broadly categorizes several, but not all, of these instruments with their related indicators. These are trade and market policies that generate price incentives or support, fiscal subsidies to producers, consumer subsidies, and general services support.[3]

[2] In this regard, WTO's Agreement on Agriculture provides a framework for repurposing agricultural support that includes concessions and commitments for Members in order to improve market access, and reform domestic support as well as trade policies. While the main aim of this Agreement is to rationalize and provide transparency in the policy arena to achieve a freer global market, the classification of support into "boxes" (amber, blue, green and development boxes) has some convergence with other approaches and objectives of repurposing agricultural support, such as a strong focus on the supply of public goods and services. For more information regarding this issue, see FAO, UNDP & UNEP. 2021. A multi-billion-dollar opportunity – Repurposing agricultural support to transform food systems. Rome, FAO. https://doi.org/10.4060/cb6562en

[3] The definitions of the various policy support instruments and related indicators originate mainly from the OECD and the MAFAP methodological guidelines (OECD 2016) and the MAFAP Methodology, Working Paper Volume I. (MAFAP 2015a).

Figure I.1: Agricultural Policy Support Instruments and Indicators



Source: FAO et al. 2022.

Price incentives, also known as market price support, are among the most widely used forms of policy support, partly because the trade and market measures that affect (and therefore support) prices are easier to implement and monitor and, usually, do not involve budgetary outlays. Trade measures such as import tariffs and quotas or minimum farm gate prices increase the domestic producer price compared to an international reference price, generating price incentives for farmers. Export taxes and restrictions, or price ceilings for consumers, tend to depress domestic prices *vis-a-vis* the international reference and create price disincentives or negative price support. One of the most common indicators to measure the gap between domestic prices and their international equivalent generated by trade and market policies is the nominal rate of protection (NRP). A positive NRP shows protection or incentives to domestic producers, while a negative NRP indicates a penalization or implicit taxation on them.

Fiscal subsidies to producers are direct payments to individual farmers or farmer groups. Unlike price incentives, this form of support has a budgetary outlay. The four main types of subsidies are (a) output subsidies, which are payments to farmers linked to the output of a specific commodity; (b) input subsidies, which include subsidies for variable inputs (e.g., seeds, fertilizer, energy, credit), fixed capital, e.g., machinery, equipment, or on-farm irrigation; and on-farm services, e.g., veterinary services, or pest and disease control; (c) subsidies based on production factors, such as income transfers to producers based on the current or past area of land allocated, number of animals, receipts or income, with production required, and (d) subsidies decoupled from production, including income transfers that are not linked with production, such as payments for retiring land out of production, payments for adopting environmentally friendly practices such as organic farming, planting cover crops, or implementing buffer zones. A common policy indicator that captures producer subsidies is the nominal rate of assistance (NRA), which quantifies the price difference between the domestic and equivalent international price for a given commodity due to trade policies and the amount of subsidies provided to producers. A positive NRA indicates net subsidies or support to the farming sector, while a negative NRA indicates a net tax or penalization.

Another category of private transfers is consumer subsidies. These are budgetary expenditures to support consumption, including final consumers and intermediaries such as mills and slaughterhouses. Key mechanisms used for this are food vouchers, school feeding programs, and payments to mills for processing grains.

Finally, general service support is expenditure not directed at individual producers but at providing public goods and services. This spending aims to alleviate market imperfections and create the enabling conditions for agricultural growth, increased farm income, and improved environmental sustainability. Some of the most relevant expenditure categories in general services include investments in research and innovation, extension services, rural infrastructure, irrigation infrastructure, and food inspection and control systems.

In summary, the total agricultural policy support is the sum of support to producers, consumers, and general services support (Figure I.1). Agricultural producers' support is defined as the sum of price incentives or market price support, measured by the NRP indicator, and fiscal subsidies to producers, measured through the NRA indicator. Importantly, other forms of spending are not agriculture-specific but still indirectly support the agriculture sector, such as rural roads, education, and health. While the core diagnostic for estimating the nature and extent of support to the agriculture sector is limited to accounting for agriculture-specific support, the scope of analysis can be expanded to agriculture-supportive expenditure, depending on the country context, objectives of the analysis, and data availability.

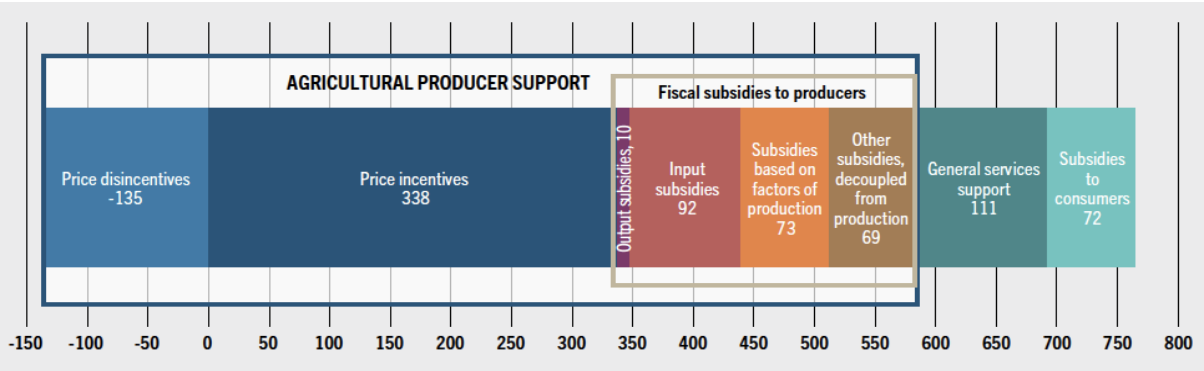
Support to Agricultural Producers Around the World

While most countries adopt a mix of policy instruments, the largest share of support is provided via price incentives and fiscal subsidies to producers (Figure I.2). Price incentives are considered the most distortive forms of support as they directly influence a commodity's market price, farm revenues, and therefore production decisions. For example, import restrictions are used to encourage production by protecting domestic producers from competition and increasing local prices. Similarly, input and output subsidies are used to incentivize production. However, they are considered less economically distortionary as they influence farmer choices by providing financial incentives through cost reduction or revenue augmentation for targeted commodities, rather than distorting market prices.

While price incentives and subsidies coupled to production boost production, they are associated with significant externalities such as the greenhouse gas (GHG) emissions associated with land use change, increased use of inputs, biodiversity loss, chronic diseases, and damage to ecosystem services (OECD 2019; DeBoe 2020). In contrast, subsidies decoupled from production and expenditures on general services support are less likely to hinder sustainability and can even promote it. Despite that, such services remain largely under-supplied, especially in low-income countries (Mogues et al. 2012; Fan et al. 2008).

Recent estimates show that the 63 countries that are responsible for 90 percent of the world's agricultural value of production transferred almost US$630 billion annually to the agricultural sector over the 2013–2018 period (FAO et al. 2022) (Figure I.2). These include countries such as China, the United States, EU countries, Japan, and other developed countries that largely subsidize the sector via trade measures and farmer subsidies. They also include countries such as Brazil, Australia, and New Zealand, which provide limited support to the sector and invest heavily in agricultural research and innovation. Some countries, including Argentina, India, Viet Nam, and many Sub-Saharan African countries, indirectly tax the sector by penalizing agricultural producers through measures that keep prices low to benefit consumers.

Figure I.2: Level and Composition of Global Support to Food and Agriculture (US$ Billion, Average 2013–2018)



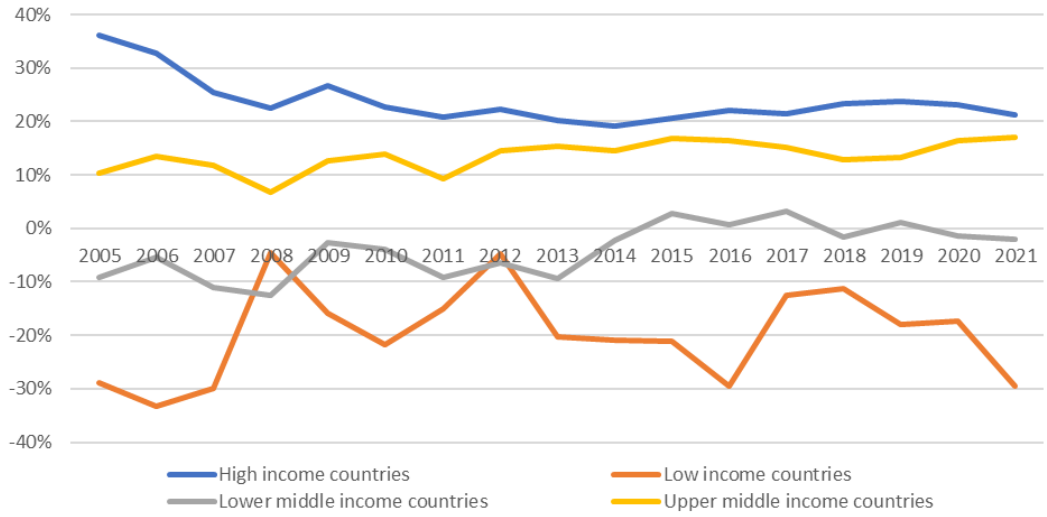
Source: FAO et al. 2022.

Agricultural Taxation Vs. Subsidization

Historically, agriculture was a source of government revenues as farming activities were taxed in most countries worldwide. As some economies developed and became more complex and integrated, and agriculture's economic importance faded, governments changed their approach to agriculture, reducing sectoral taxation and increasing subsidies (Anderson 2009). This evolution has left agriculture one of the most protected sectors worldwide, and nowadays, efforts to remove governments' intervention in the sector remain contentious.

Most low- and lower-middle-income countries continue to 'tax' or implicitly penalize their agriculture sectors, while high- and upper-middle-income countries support or subsidize the sector. As shown in Figure I.3, low- and lower-middle-income countries had a negative NRA over the last 15 years, indicating that they taxed their agricultural sectors. In contrast, high-income and upper-middle-income countries had a positive NRA, at over 20 percent in almost all years in the last 15 years. Long-term trends in agricultural support levels show a slow convergence between countries, as developed economies have decreased their support to the sector while developing economies have removed policies that directly or indirectly tax it (FAO, UNDP, & UNEP 2021; OECD 2022). These trends, however, mask significant variations in the level and composition of policy support across countries.

Figure I.3: Nominal Rate of Assistance by Income Group



Source: Ag-Incentives, 2023, based on data from the OECD, FAO, IDB, and World Bank, compiled by the International Food Policy Research Institute (IFPRI).

Acknowledging Specificities of Country Agricultural Policies

Most countries' agricultural objectives and policy strategies are embedded in multi-year sectoral programs that, in many cases, are renewed every time a new government takes office. Agricultural policies have numerous objectives and target diverse domains. These include food security, productivity, sustainability, rural development, and, more recently, energy, climate, and biodiversity objectives. Reflecting their diversity, policy instruments and support measures toward agriculture vary across countries and between commodities within countries (Anderson, Rausser, & Swinnen 2013).

The variety and complexity of country approaches to agricultural policy and diverse objectives suggest there is no single best policy mix for all governments to adopt. Instead, defining a policy mix that effectively achieves the government's goals is key, including minimizing the sector's negative environmental impacts and accounting for the country's priorities, resources, and context. However, as highlighted earlier, most current agricultural support policies are distortive, with significant hidden costs. There is also considerable misalignment between governments' objectives, the policies they put in place, and the incentives these policies generate. While most policy support targets farmers, it still fails to ensure food security or enhance farmers' incomes and damages the very ecosystems that support agricultural production and livelihoods of farmers).

Repurposing some distortive producer support toward provision of public goods and services can significantly improve food security and livelihoods while reducing negative environmental externalities. Repurposing agricultural support should improve coherence between agricultural policies, development objectives, and food system transformation. For example, repurposing some support from input and output subsidies toward agricultural research and technological innovations can improve productivity and reduce agriculture's negative environmental impact (Gautam et al. 2022).

A Toolkit for Repurposing Agricultural Support

This toolkit provides guidance to practitioners, in governments and their development partners, in identifying, classifying, and evaluating agricultural policies and support programs. Its primary focus is on assessing their alignment with country-level objectives and other higher-level goals, such as the

SDGs. Hence, this document gathers knowledge on a range of tools that can be used to measure agricultural policy support and identify repurposing options toward achieving the country's strategic objectives in a sustainable manner. The toolkit is a living document, which will be updated with new materials and information as they become available.

The first step in repurposing public policies and agricultural support involves stocktaking the policy incentives. The methodology explained in Modules 2 and 3 of this toolkit is primarily based on Monitoring and Analyzing Food and Agriculture Policies (MAFAP) (unless stated otherwise). It is the most comprehensive and broadly accepted approach to measuring policy incentives at the farm gate. This methodology is very similar to the OECD incentives analysis but is more applicable to the developing country context. The core indicators produced by the MAFAP approach are consistent with those produced under the OECD, allowing for easy comparison and benchmarking. A key feature of this approach is that it goes beyond traditional Public Expenditure Reviews (PERs) and accounts for price support (or incentives) induced by policy measures. Including this component is instrumental in estimating the net transfers to the sector. These policy instruments can often be misaligned. For example, countries can spend significant budgetary resources to provide input and output subsidies to incentivize production yet adopt policy measures that depress producer prices and discourage production, such as export restrictions. This approach acknowledges the growing recognition that achieving agricultural transformation requires more than just an increase in public expenditures; it underscores the crucial role of creating an appropriate policy environment. The MAFAP approach also categorizes support into functional categories, which helps us understand the mechanisms employed to support the sector. This diagnostic focuses on the following questions: What is the level of support to the agriculture sector provided by different policy measures? What are the mechanisms employed to deliver this support? Do they align with a country's stated development goals? What are the feasible repurposing options for making this support more effective, sustainable, and equitable?

Beyond measuring sectoral support, Module 4 provides some suggestions on complementary economic analysis for policy evaluation and identifying specific actions for governments to repurpose their agricultural policy support. For example, the efficiency and effectiveness analysis can highlight if the existing policy frameworks and public expenditure decisions have delivered the desired outcomes and the investment return. It can provide evidence of which instruments outperform others in the country's context. Similarly, an incidence analysis can highlight whether the targeted beneficiaries receive the program. An assessment of the institutional delivery set-up can highlight operational and governance challenges for improvement instead of simply increasing spending or budgetary allocation to a specific function. As well as these complementary ex-post analyses, the toolkit also mentions some tools to conduct ex-ante analysis of trade-offs and compare outcomes from current policies against various possible repurposing scenarios.

As with any policy change, there will be winners and losers with repurposing. Understanding why existing agricultural support policies are in place, even if misaligned with a country's goals, can help determine the processes required to change the policies and programs. This type of policy analysis introduced in Module 5, called political economy analysis, can help assess the political feasibility of different policy and expenditure reform options. It focuses on understanding *how* repurposing can be implemented from a political economy perspective.

There are, of course, important aspects of agrifood system transformation that the toolkit does not consider. The first major limitation is that even though, in principle, reforming and repurposing policies are intended to contribute to the very broad agrifood system transformation agenda, the methodology described in this toolkit focuses on measuring and repurposing policies and expenditures that mainly target producers and influence incentives at the farm gate. While the methodology for measuring policy support outlined in the toolkit also includes indicators of support to other actors such as consumers through various food assistance policies and programs. However, approaches to

estimate net incentives to other actors in the value chain such as processors are not fully developed. Hence, the choice to focus on measuring support at the farm gate is primarily driven by existing widely used and accepted methodology and the availability of consistent data for many countries. Therefore, this toolkit should we viewed a live document that will be updated with additional modules as methodologies are developed to measure incentives beyond the farm gate. However, given that most government policies and support target primary agriculture, the toolkit can significantly support transformation in the agrifood sector.

Another limitation is that the toolkit primarily focuses on evaluating and repurposing national public policies and support, even though achieving the goal of a food system transformation commands international cooperation. This implies that what may be optimal from a country's point of view might be suboptimal for other countries, oppose global objectives, or vice versa. Similarly, the political economy section focuses on national-level policies and omits questions regarding the level at which policy reform should be addressed.

This toolkit provides guidance on analyzing agricultural policies that are nationally formulated and implemented. Certain policies in certain circumstances, e.g., in the case of a "large" economy, have spillover effects. Addressing these shared issues requires collective action and global and regional negotiations. The toolkit suggests using approaches such as a dynamic general equilibrium analysis to understand the spillover effects of domestic policy responses.

This toolkit is organized around five modules described below and concludes with key takeaways. The modular nature of the toolkit allows the user to choose the types of analysis and methodology depending on the type of diagnostic required.

Module 1: Setting the Repurposing Agenda

- Overview of country's economic situation and agricultural policies
- Coherence analysis to align policies with government objectives
- Best practices for inclusive, evidence-based policy dialogues

Module 2: Public Expenditures on Agriculture

- Overview of international and regional initiatives
- Guidance on collecting and synthesizing data on agricultural support
- Core diagnostic framework and examples for measuring expenditure

Module 3: Price Incentives for Agricultural Commodities

- Methodologies, tools, and case studies for analyzing price incentives
- Illustration of combining expenditure and price incentives data
- Summary indicators, such as the NRA, for a comprehensive view of policy support

Module 4: Methods to Evaluate Policy Impacts

- Guidance for ex-post analysis of policy impact
- Ex-ante analysis for policy trade-offs and synergies
- Assessing impact on various outcomes of interest

Module 5: Tools to Understand the Political Economy of Repurposing Agricultural Policies

- Various approaches for political economy analysis
- Identifying viable and politically feasible repurposing options

MODULE 1: SETTING THE REPURPOSING AGENDA

A comprehensive study of a country's agricultural policy landscape is crucial to reshaping agricultural support for transformation goals.[4] This process starts with an overview of a country's agrifood system and economy, followed by a review of the policy frameworks. The next step is to take stock of the agriculture policy support measures in place in a given country by carefully reviewing public expenditure and price incentives policies, their level, trends, characteristics, and their coherence against the existing development objectives. After examining the type of support in place and broad policy coherence, the next step is to identify repurposing options for policymakers, assess their potential impacts and feasibility, and engage in policy dialogues with stakeholders to agree on desired policy reforms or repurposing activation to pursue. Modules 2 to 5 provide guidance on methodologies that can be used to generate evidence at each stage of this process.

1.1. DESCRIBING THE COUNTRY'S ECONOMIC CONTEXT

It is important to have an overview of the economy and the agrifood system to understand a country's context better and identify appropriate policies. The country and sectoral topics include the following:

- The country's socioeconomic status and a description of its macroeconomic development challenges. It should include data focusing on indicators that provide current and historical information on the level and evolution of the economy. Key elements include economic growth, poverty, employment, inequality, inflation, trade, and main sectors.
- Agriculture's role in the country's economy, particularly its relevance to economic development. This should be validated by data that highlights the current state and past trends, including the sector's contribution to GDP, employment, income, and trade.
- A description of the challenges facing the agriculture and food sector. These typically include productivity, competitiveness, livelihoods, food security, food inflation, nutrition, and greening of the sector, among other things. Key issues should also be identified based on their urgency or salience among the broad spectrum of issues.
- Existing agricultural and rural development policy frameworks (see Section 1.2). This should include a discussion of whether the objectives and related strategies and policies to achieve them align with a sustainable food system. For example, the country may have a strategic objective of full self-sufficiency. Even if all derived support instruments are coherent with this strategy, the effectiveness of public agricultural expenditures to strengthen sustainable food systems will be low.

Identifying relevant indicators and selecting measurable ones with an easily identified source is important. Table 1.1 provides a non-exhaustive list of indicators that can be considered. It is equally important to define a period for the ex-post analysis. The practicalities of data availability often drive the proposed durations of 5 to 10 years. The recommendation of covering a minimum period of five years is to allow observation of trends (albeit minimal) and avoid conclusions driven by outlier years.[5] In collecting data, it is crucial to gather reliable information. Information used should also be that which will continue to be updated and accessible in the future; information from public entities usually satisfies these criteria. However, public sources do not always guarantee access to sufficient quantity and quality information. Under these circumstances, other non-public sources, including international organizations, universities, NGOs, and other stakeholders, may be an alternative source of information

[4] A template Terms of Reference for a consultant to conduct such work is provided as an Appendix.

[5] For ex-ante analysis, as discussed in Module 4, forward looking simulations should consider a timeframe that is relevant for the specific agenda and goals. For example, if has clear emission targets for the year 2050 then the simulation should account for the timeframe for achieving these targets.

(Table 1.1). Regardless of the source, it is essential to assess the reliability of information, including the methodology used to produce it.

Table 1.1: Key Variables and Sources

Variable	Primary source(s)	Alternative suggested sources
• GDP • Agricultural GDP • Agricultural value of production	• National Institute of Statistics • Central Bank • Ministry of Finance • Annual Report of President	• World Bank • International Monetary Fund • Regional development banks • Others: FAOSTAT, the IFPRI, the Organization for Economic Co-operation and Development (OECD), etc.
• Overall and Food Consumer Price Index (CPI)	• Central Bank • National Institute of Statistics • Annual Report of the President	• World Bank • International Monetary Fund • Regional development banks • Others: FAOSTAT, IFPRI, OECD, etc.
• Agricultural sector employment (absolute and share of overall)	• National Institute of Statistics • Central Bank • Ministry of Employment (or equivalent) • National Survey of Employment • Annual Report of President	• World Bank • International Labor Organization • Regional development banks
• Household food expenditure • Poverty (rural and urban) • Inequality (in terms of income and food expenditure) • Share of households relying on agriculture for livelihood • Share of the population that is food insecure • Malnutrition rates • Children stunting rates	• National Survey of Household´s Income and Expenditure •	• Local universities/NGOs • International Organizations
• Total exports and imports • Agricultural exports and imports •	• Central Bank • National Institute of Statistics • Ministry of Finance • Annual Report of President	• Word Trade Organization • UN Conference on Trade and Development (unctadstat.unctad.org) • UN COMTRADE database (comtrade.un.org) • International Trade Center (intracen.org) • World Bank (tcdata360.worldbank.org)
• Exchange rate	• Central Bank	• International Monetary Fund (IMF) (www.imf.org/external/np/fin/data/param_rms_mth.aspx)

When collecting information on public policies and other aspects of the country's situation, it is helpful to remember a few general principles. The collection and processing of information must be systematic and organized. The better organized the information, the easier it is to handle, saving time and effort later. Second, it is important to work with the most reliable and likely-to-be-updated data source when collecting information. Finally, it is important to maintain a reference source for where

the information was obtained, e.g., web pages, documents, reports, or other sources, as this information can help justify one's results later if needed.

1.2. REVIEWING AGRICULTURAL AND RURAL POLICY FRAMEWORKS

The initial preparation step for agricultural repurposing involves analyzing recent agrifood system policies and frameworks. This assessment considers their alignment with broader development strategies the national government sets. These include strategies on rural development, the agricultural sector, and its subsector strategies, such as those on livestock, rice, agriculture land policy, and school feeding policies. It is also crucial to consider the wider economic policy environment that may impact the sector's development. This includes evaluating rural development policies and general macroeconomic interventions (Balino et al. 2019).[6]

By assessing agricultural policy strategies, the policy analyst should be able to do the following:

- Map key policies and policy frameworks to define the government's vision for the agriculture sector. This should include sector growth targets and expected contribution to job creation, poverty reduction, food security targets, and other aspirations (see Box 1.1 for an example from Rwanda).

- Identify key stakeholders.

- Assess the extent to which national and sector strategies align with sectoral goals. This also involves understanding policy trade-offs made by the government to achieve sector objectives. Such trade-offs include the dilemma between agriculture and food policy options, e.g., providing sufficient price incentives to producers to encourage production versus maintaining low food prices to ensure food affordability, especially for urban consumers. This assessment should also question if the stated objectives and policies are grounded in evidence and achievable given the country's context.

- Identify the main government policy instruments to regulate or support the sector. This may include a broad range of policies, including farm subsidy schemes and public investments in public goods such as infrastructure and market facilities to address market failure. Other instruments may address land or market regulations and trade measures, such as import tariffs and export bans.

- Determine the government institutional arrangement for implementing the sector strategy, including implementing agencies such as ministries of agriculture, livestock, infrastructure, water, food security (or equivalent, depending on the government structure), parastatals, and other public institutions.

[6] See the following approach and methodological framework to trace and analyze a wide range of policies and strategies, within and outside the agricultural sector. https://www.iisd.org/system/files/publications/agricultural-bias-in-focus.pdf

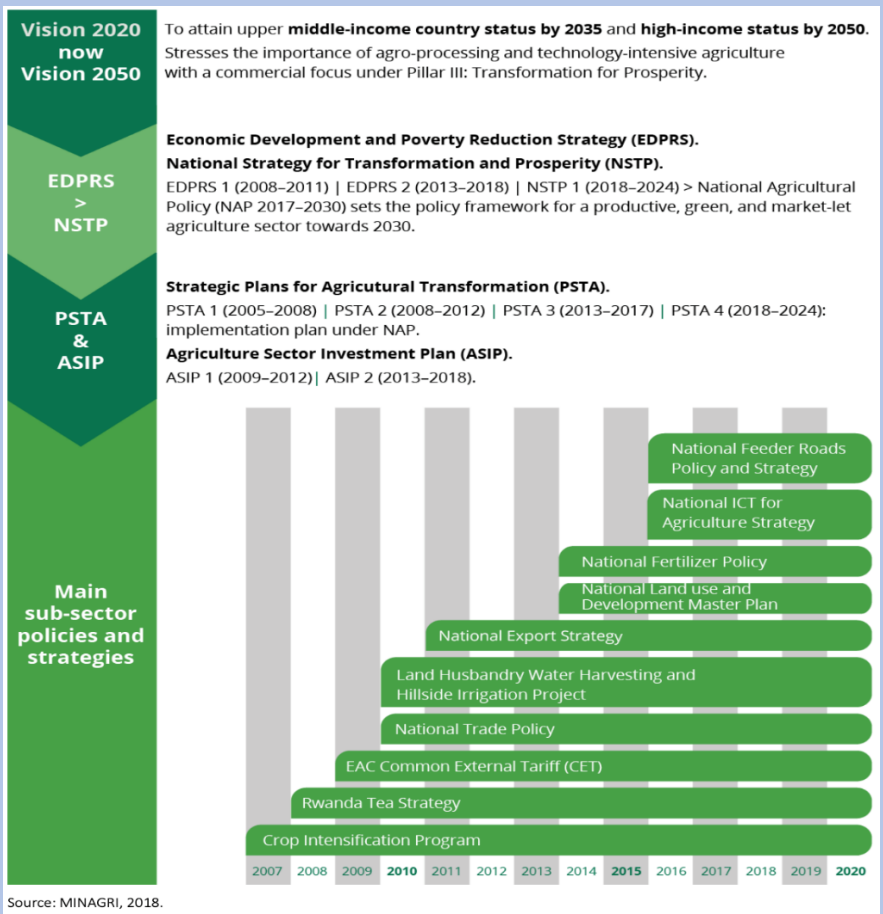
Box 1.1: Rwanda's Agricultural Policy Strategies

Rwanda's high-level development strategy, Vision 2020, has been superseded by Vision 2050. Under this strategy, Rwanda aspires to attain upper middle-income country status by 2035 and high-income status by 2050. Vision 2050 stresses the importance of agro-processing and technology-intensive agriculture with a commercial focus under its Pillar III: Transformation for Prosperity.

The newly developed National Strategy for Transformation (NST1 2018–2024), replacing the Economic Development and Poverty Reduction Strategy (EDPRS 2013–2018), complements Vision 2050 and reflects the agriculture sector's role in economic development and poverty reduction.

The National Agriculture Policy (NAP 2017–2030) sets the policy framework to address the agricultural component of the NST, while the Strategic Plan for Agricultural Transformation (PSTA4 2018–2024), currently in its fourth phase, is designed as its operational framework. The Agriculture Sector Investment Plan (ASIP 2013–2018) was the guiding document for public agricultural investment when implementing PSTA3 (2013–2017). Figure 1.1 provides a schematic account of the national strategies, strategic agricultural frameworks, and the main subsector policies and strategies in Rwanda.

Figure 1.1: Key Agricultural Policy Frameworks, Rwanda



Source: Tuyishime et al. 2020.

1.3. ASSESSING THE COHERENCE OF EXISTING POLICIES

Reviewing the coherence of policies with international or country-level development goals is the first step to identifying the need for policy reform or repurposing actions.

Policy coherence analysis involves reviewing development and agricultural objectives and strategies, as described above, which are then compared to policies in place. Such policies are analyzed by measuring public expenditures and price incentives (Modules 2 and 3). In this way, it is possible to analyze policies' coherence (or lack thereof) with the government's development objectives. Such analysis can also reveal policy gaps, where there is a lack of policies and investments to achieve government objectives and highlight emerging policy misalignment or unintended effects.

When analyzing the coherence of agricultural support policies, we should consider three dimensions: their coherence with government objectives, their coherence across the sector, and the coherence of their effects against the expected ones.

1.3.1. Coherence with Government Objectives

This part of the coherence assessment seeks to address whether agrifood policies, expenditures, and investments align with the government's explicit development objectives. This means identifying the government's strategic objectives for the economy, the agrifood sector, and its different subsectors and value chains. These objectives are usually identified by reviewing the policy frameworks described in Module 2.

For example, a country's government may have planning documents that recognize agriculture as an engine of economic growth; it may recognize its intention to implement policies that sustain agricultural productivity, generate sectoral employment, and reduce poverty. If a planning document states that the government's key priority is fostering agricultural exports and export revenues from agricultural products, the price incentives analysis can help assess the extent to which the policies and marketing environment around strategic export crops support these objectives. Similarly, the level and type of public investments made in different commodity groups can inform whether ongoing investments are sufficient.

Regional and global commitments can also play a role in setting government objectives. Country policymakers must consider this factor when framing their economic and agricultural strategies. For example, in Africa, the Comprehensive Africa Agriculture Development Programme (CAADP) calls for countries to invest 10 percent of their public resources in agriculture to help achieve a 6 percent growth rate for the sector. Similarly, the Nationally Determined Contributions of each country under the Paris Agreement specify efforts by each country to reduce national emissions and adapt to the impacts of climate change. Public expenditure indicators allow policymakers to check whether and to what extent this commitment is fulfilled.

1.3.2. Coherence of Government Policies

One must consider the consistency between the policy instruments and fiscal (budgetary) measures on agricultural value chains and the government's stated objectives. This analysis allows one to understand whether sectoral and specific value chain policies are part of a coherent policy framework across the sector.

The public expenditure and price incentives analyses described in Module 3 indicate policies that have been implemented; comparing these measures to the government's stated objectives helps determine the alignment and coherence of the policies. For example, a government's objective might

be diversifying agricultural production. However, if budgetary and policy support is focused on the production of a few staple crops, it will discourage farmers from diversifying.

1.3.3. Coherence in Terms of Policy Effects

When evaluating policies, it is essential to assess the impact of trade, market, and budgetary policies, including price incentives, and determine whether they align with the intended objectives. It is also crucial to pay attention to how the various support measures interact for achieving development goals to understand sector-wide coherence. Similarly, it is equally important to understand the modalities of implementation as the final impact of an announced policy is determined by the extent of implementation. The price incentives and public expenditure analysis described in Modules 2 and 3 help build a strong knowledge of the policy environment around agricultural commodities and provide a sound basis for investigating their alignment and coherence. For example, a thorough analysis must explore whether announcing a minimum support price increases the domestic price of the specific commodity. It is possible that these announcements have no bite because the government does not have the fiscal capacity to intervene in the market and influence market price.

Through this assessment, it is possible to determine whether a specific policy intervention is achieving its intended impact. For example, if a government implements high import tariffs to protect domestic crop producers facing stiff competition from imports, price incentive indicators can provide evidence of whether these policies are achieving their desired effects. Building on price incentive indicators, additional analysis, e.g., of incidence, efficiency, and effectiveness, and ex-ante CGE modeling, can address more complex questions. These may include understanding how incentives influence production and food security or how price distortions affect the welfare of producers and consumers. Using public expenditure indicators, we can also assess the impact of specific investments or their efficiency to understand if these are the optimum way to support a given agricultural subsector or value chain. Box 1.2 highlights an example of policy coherence analysis insights.

Box 1.2: Mali's Agricultural Policy Coherence, Based on Public Expenditure Review

Table 1.2 summarizes some of the results of a policy coherence assessment for Mali for 2005–2017, based on policy review, price incentives, and public expenditure analyses conducted using the MAFAP approach and methodologies.

Table 1.2: Policy Coherence Assessment Summary, Mali

Regional commitment	**Policy and effect**	**Policy coherency level**
In 2015, Mali validated its CAADP ten-year investment plan: The National Programme for Investment in the Agriculture Sector (PNISA) reaffirming Mali's commitment to allocate at least 10 percent of the national budget to the agricultural sector and to achieve at least 6 percent agricultural growth annually.	Mali met the 10 percent CAADP target in 6 out of 13 years between 2005 and 2017, and the trend is erratic and downward.	**MEDIUM**
	Mali surpassed the 6 percent CAADP annual agricultural growth target between 2005 and 2019.	**HIGH**
National Investment Plan for Agriculture (PNISA) objectives	**Policy and effect**	**Policy coherency level**
PNISA embodies Mali's vision to transform the agriculture sector by 2025. PNISA promotes five priority value chains: rice,	Public expenditure in the past years focused more on **cotton and rice**. However, public spending has gradually spread to other PNISA priority products in recent years. For example, in	**MEDIUM**

maize, millet and sorghum, inland fisheries, and livestock products. PNISA is structured around the following strategic axes: 1. Capacity building of actors involved in agricultural development activities. 2. Investments in secure land tenure systems, management of natural resources, and irrigation and water management systems. 3. Measures aimed at promoting the production and competitiveness of the agro, sylvo-pastoral, and fishing sectors. 4. Training and research in support of production systems. 5. Better social protection to respond to the problem of food insecurity and nutrition.	2009, the Rice Initiative was extended to maize, wheat, sorghum, and millet to enhance the policy objective of agricultural diversification. Production volumes of these products have also increased significantly.	
	Though Mali is one of the world's most climate change-affected countries, **expenditure on forestry, land management, and environmental protection is low** (4 percent of agricultural expenditure). However, the government invested in irrigation infrastructure to mitigate the effects of drought. Spending on irrigation accounted for 28 percent of agriculture expenditures.	**LOW**
	Agricultural expenditure was largely focused on the crop subsector, while expenditures on livestock and fisheries subsectors were low compared to their contribution to agricultural GDP.	**LOW**
	Expenditures on **research and extension services** have increased in recent years. However, the average spending on agricultural research as a share of agricultural GDP is 0.3 percent. This is below the African Union's target to allocate at least 1 percent of agricultural GDP to research.	**MEDIUM**
	Input subsidies (mainly fertilizers) dominated agricultural expenditure, 29 percent on average between 2005 and 2017, while investments to improve efficiency in input use, such as research and extension, were low. This could result in inefficient input use, which can deplete natural resources and hinder the achievement of strategic axis (ii). In addition, subsidy programs could crowd out the development of commercial input distribution channels.	**LOW**

Source: Nkuingoua and Pernechele 2022.

1.4. POLICY DIALOGUE TO SET THE REPURPOSING AGENDA

Repurposing agricultural support policies entails trade-offs between competing policy objectives and beneficiary groups. For instance, reforming or repurposing policies that currently protect and subsidize rice production, a commodity associated with high greenhouse gas emissions and limited micronutrient content, could contribute to climate change mitigation and nutrition goals. However, decreasing such support might also lower production and affect the calorie intake and food security of the 3 billion people worldwide who rely on rice as a staple food (FAO, IFAD, UNICEF, & WFP 2022).

Regardless of their technical nature, policy reforms tied to the repurposing agenda hold political implications. Their acceptance or opposition from constituencies depends on how they perceive the gains, losses, and alignment with their policy beliefs. For example, certain groups may prioritize calorie availability over nutrition objectives or view the aim of self-sufficiency as more important than relying on global trade for food availability (refer to the Political Economy section). Vested interest groups will also strive to influence the repurposing agenda, either maintaining the status quo or, as a second-best option, steering it toward their desired outcomes (see Box 5.3).

Inclusive policy dialogue serves as a means to address the political dimension of the repurposing agenda. This approach encompasses three key repurposing ideas: it provides a platform for knowledge exchange between evidence providers and policymakers, serves as a governance mechanism for the state, and acts as a negotiating instrument for non-state actors (Robert et al. 2020). Policy dialogue

avenues, such as multi-stakeholder platforms, can highlight the knowledge, interests, and expectations held by the state, private sector, and civil society organizations around repurposing reforms. Policy dialogue sets the stage for an informed negotiation and policymaking process (Faysse 2006; IFPRI 2022). Inclusivity is especially crucial for marginalized communities, including small farmers, young people, and women. These groups often encounter collective action challenges and power imbalances that hinder their ability to influence policy reforms.

1.4.1. Policy Dialogue at the Global Level

The repurposing agenda is fundamentally transnational: food and agricultural systems are increasingly globalized as goods and people move across geographical areas. As such, these systems face global market failures that states can only address through collective action to deliver international public goods (Von Braun 2018; Wang et al. 2022). These goods include trade policies for food security, global research for sustainable agriculture, climate change adaptation efforts, and transboundary food safety. Global governance must also set international norms, standards, and commitments for food systems (Von Braun 2020).

A single comprehensive forum for a global dialogue on repurposing agrifood policies doesn't exist. Instead, different global organizations and governance mechanisms can be utilized for such dialogue, their relevance varying based on the specific reforms being discussed. While cross-cutting organizations and processes such as the Rome-based UN agencies, the Committee on Food Security, and the UN Food Systems Summit (UNFSS) are critical to engaging on the repurposing agenda, more specialized avenues are also important (Table 1.3). For example, changing trade policy may involve the World Trade Organization (WTO), while adjusting input subsidies in European countries would engage the European Union and the OECD.

Inclusivity is an important aspect of these forums. Including constituencies, such as farmers, consumers, and Indigenous Peoples civil society organizations, in debates on repurposing may boost the legitimacy, accountability, effectiveness, and inventiveness of the discussed reforms (Von Braun 2018). Discussions can ultimately help in adopting and implementing these changes at the country level.

Table 1.3: Global Policy Dialogue Avenues in the Repurposing Policies Agenda

Sector/Specialization	Intergovernmental Organizations and Mechanisms	Other Organizations
Specialized organizations and mechanisms in the agriculture, food, and nutrition sector	• FAO • CFS • International Fund for Agricultural Development (IFAD) • World Food Programme (WFP) • UNFSS • UN Decade of Action on Nutrition • Global Forum for Food and Agriculture (GFFA)	• Global networks of farmers' organizations, e.g., World Farmers Organization, La Via Campesina • Global Alliance for Improved Nutrition (GAIN) • CGIAR • Multinational agribusiness platforms, e.g., GAP Initiative • Scaling Up Nutrition (SUN) • Just Rural Transition (JRT) Initiative and JRT Policy Action Coalition

International organizations with food and agricultural programs	• World Bank[7] • United Nations Development Programme (UNDP) • Regional Intergovernmental Platforms: OECD, European Commission, Comprehensive Africa Agriculture Development (CAADP) • Regional Development Banks, e.g., Inter-American Development Bank	• NGOs with a focus on food and agriculture, e.g., Oxfam, CARE, Concern • Private foundations, e.g., Rockefeller, BMGF
Specialized organizations and mechanisms focused on other sectors relevant to agriculture, food, and nutrition	• United Nations Environment Programme (UNEP) • Intergovernmental Panel on Climate Change (IPCC) • International Labor Organization (ILO) • Global Environment Facility (GEF) • World Health Organization (WHO) • UNICEF • WTO • United Nations Development Fund for Women (UNIFEM) • Global Biodiversity Framework • UN Decade on Ecosystem Restoration	• Environmental NGOs, e.g., WWF, Greenpeace • NGOs with watchdog function over global organizations, e.g., Global Policy Forum • International Union for Conservation of Nature (IUCN)
Governance bodies in charge of UN conventions relevant to food and agriculture	• United Nations Framework Convention on Climate Change and COP Presidency, including the Koronivia Joint Work on Agriculture • Green Climate Fund • Convention on Biological Diversity and the UN Decade on Biodiversity Action • United Nations Convention to Combat Desertification (UNCCD) • International Treaty on Plant Genetic Resources for Food and Agriculture	• NGOs and networks with observer status • Business organizations and networks with observer status
General governance bodies with coordination functions	• United Nations Secretariat, Assembly and Security Council, UN Economic and Social Council (ECOSOC) • G7, G20, including the Leaders Pledge for Nature	• NGOs and networks with observer status • Business organizations and networks with observer status

Source: Adapted from Von Braun 2018; FAO, UNDP, and UNEP 2021; Just Rural Transition 2022.

1.4.2. Country-Level Policy Dialogue

Global policy dialogue can foster unity among countries, enabling them to exchange knowledge, experiences, challenges, and successes. This collaboration can build consensus and momentum for policy reform. However, agricultural support policies are fundamentally a national prerogative, and policy reforms ultimately take place at the national level through the passage of national legislation. Country-level reforms may involve adjusting input and output subsidies to promote sustainable

[7] The World Bank and UK FCDO have co-convened more than 10 global agricultural policy dialogues and produced several technical dialogues since COP26 with the obective of repurposing agricultural support that promotes climate mitigation and adaptation, whilst also ensuring greater equity in the sector.

agricultural practices, boosting investment in national research and development systems, or implementing trade policy reforms to facilitate food movement.[8]

At the country level, policy dialogue on these reforms should follow two directions. Horizontally, it must involve key players in the various sectors involved in repurposing. Vertically, it should involve the populations affected by repurposing, such as vulnerable communities, young people, women, and Indigenous Peoples.

Horizontal Policy Dialogue

Repurposing agricultural support policies entails trade-offs between various policy sectors. For instance, reducing import tariffs on nutritious foods might increase their availability and affordability, but reduce fiscal revenue for the state. Similarly, phasing out input subsidies can benefit the environment and reduce price distortions that funnel resources toward crops with detrimental nutrition outcomes, e.g., sugar, but deprive some farmers of vital income.

Repurposing could also have distributional consequences across the public organizations in charge of them. For example, the Ministry of Agriculture generally manages input subsidy programs, but social transfers tend to be external, e.g., under the Ministries of Social Affairs or Ministries of Health. The Ministry of Agriculture might oppose the reform, even if farmers support it. The political dynamics of repurposing will affect both society and public administration (see Module 5). Additionally, sectoral agencies have expertise and mandates specific to their sectors. In the given example, the Ministry of Social Affairs and the Ministry of Agriculture may not be the most qualified to advise on strategies for phasing out input subsidies or targeting consumer transfers, respectively.

For that reason, it's essential to facilitate a cross-sectoral dialogue involving key stakeholders from each relevant area of the discussed repurposing reforms. These sectors encompass, among others, food, nutrition, agriculture, trade, environment, health, education, energy, and finance. Governments could explore the establishment of integrated institutional platforms that bring together ministries, departmental agencies, and other public bodies responsible for these sectors (FAO, UNDP, & UNEP 2021). For instance, inter-ministerial committees can meet regularly around a well-defined set of policy reform objectives. This was the case when developing the Childhood Obesity Plan in England, which gathered several ministries responsible for distinct elements of healthier food environments, e.g., social care, local development, and others (FAO, IFAD, UNICEF, & WFP 2022). The platforms can also be expanded to include civil society, as in Brazil with the multi-stakeholder and multisectoral National Food Security and Nutrition Council (CONSEA) between 1993 and 2019 (FAO, IFAD, UNICEF, & WFP 2022; Santarelli, Marques Vieira, & Constantine 2018). These platforms can serve as forums for negotiation and governance, making it easier for public agencies, the government, civil society, and the private sector to collaborate on policy reform.

Vertical Policy Dialogue

Horizontal dialogue platforms bring together various stakeholders to ensure inclusive repurposing. However, a common criticism is that these platforms often overlook vertical power imbalances among their constituencies (Faysse 2006). Representatives of groups with less power, such as small farmers' organizations, might be unable to articulate or defend their interests but unwillingly provide a seal of approval for the reforms by participating in the platform. More influential commercial farmers may

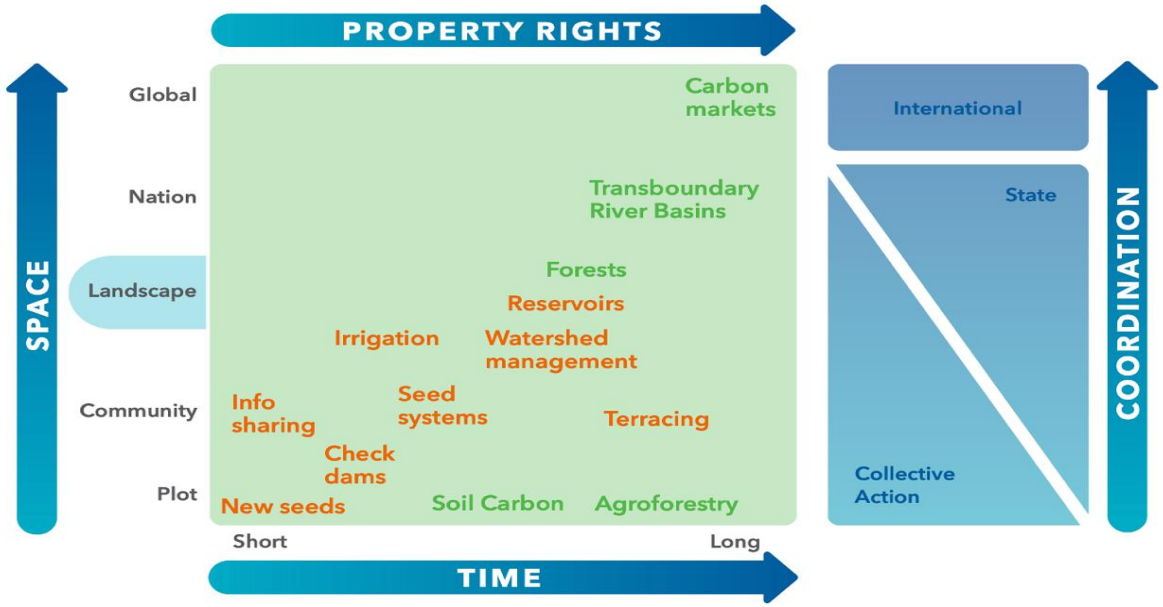
[8] As Davis, Lipper and Winters (2022) and Gautam et al. (2022) note, what is and isn't good repurposing reform can be highly country-specific. For instance, the message around the use of inorganic nitrogen fertilizer should be to encourage a reduced use in China, India, the U.S. Midwest, some parts and Europe and Brazil. In contrast, increased (efficient) use should be promoted in some parts of Sub-Saharan Africa, the U.S. West, Mexico, Northeast Brazil, Bangladesh, and Indonesia.

represent smallholder farmers but can have different interests and agree on reforms that are unfavorable for smaller producers (Meinzen-Dick et al. 2022).

To address this concern in policy dialogue, participants can actively acknowledge that an institutional platform may not completely eliminate power imbalances. They can establish clear procedural rules to counteract this issue, ensuring a shared right to decide who participates, the roles they play, and inclusive decision-making mechanisms, such as the principle of one participant/one vote. To address equity concerns, involving a neutral facilitating institution (Faysse 2006; Ratner et al. 2022) and implementing participation mechanisms like rotational leadership, small-group discussions, or the Chatham House Rule[9] (Meinzen-Dick et al. 2022; Robert et al. 2020) can enhance engagements and agency for all involved. The WHO recommends using an institutional diagnostic tool to identify and address conflicts of interest in nutrition policy reform processes, particularly instances where agrifood companies may attempt to undermine multistakeholder platforms (Pan American Health Organization 2021).

Another way to enhance vertical inclusivity is by adjusting the scale of the policy dialogue. Meinzen-Dick et al. (2022) argue that governance at the landscape level can strongly foster a ''shared vision and coordinated actions among people with diverse livelihoods, resource uses, and interests'', including government, communities, and the private sector. The landscape level sits between the community and national levels (Figure 1.2) and can facilitate collective action on repurposing reforms. These reforms involve redistributing access to resources at a local scale, extending beyond social and administrative boundaries. They encompass aspects such as irrigation, water management, and alterations in land use rights linked to agricultural investments.

Figure 1.2: The Role of Coordination Institutions and Property Rights in Responding to Climate Change



Source: Meinzen-Dick et al. 2022.

[9] The Chatham House Rule was created by British think tank Chatham House to facilitate open discussions in private meetings. It states that "When a meeting, or part thereof, is held under the Chatham House Rule, participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed" (Chatham House 2022).

1.5. USING EVIDENCE IN POLICY DIALOGUES

Evidence, especially of the type described in Modules 2–4 of this toolkit, is an important resource for inclusive repurposing policy dialogue (FAO, UNDP, & UNEP 2021; Gautam et al. 2022; Robert et al. 2020). Evidence supports informed discussions by measuring the trade-offs of repurposing reforms in areas like production, food security, nutrition, poverty reduction, climate change, biodiversity, and fiscal resources. On the qualitative spectrum, policy reform case studies can be cautionary examples highlighting the pitfalls of poorly managed or designed repurposing processes[10] or provide valuable insights from successful reforms.[11] Including Indigenous and customary knowledge creates a space for improved quality, equity, and legitimacy in dialogues with communities impacted by the reforms (Meinzen-Dick et al. 2022; Sletto 2008; Strassheim & Kettunen 2014).

In many cases, barriers hinder the use of evidence, while in others, certain factors facilitate its integration into policy dialogues. Annex Table A.1 provides an overview of the barriers and enabling factors.

1.5.1. Barriers to the Supply and Use of Evidence in a Policy Dialogue About Repurposing

There are well-documented challenges in incorporating evidence into policy reform (Carden et al. 2019). On the demand side, policy stakeholders may lack institutional, financial, and human resources to access and process the evidence (Jones et al. 2009; Uneke et al. 2017; Waqa et al. 2017). The opportunity cost of going through the evidence is high for decision-makers who are short on time and potentially lack the training to understand research results (Bowen & Zwi 2005; Hanney et al. 2003; Strydom et al. 2010). Policymakers may also resist the idea of evidence as a solution for policy problems (Cronin et al. 2015; Omamo 2003), instead of using their own judgment, experience, and political knowledge (Godfrey, Funk, & Mbizvo 2010; Head 2016; Oliver et al. 2015). This is especially the case when evidence presents ambiguous findings with recommendations that are politically or financially costly (Benson, Mabiso, and Nankhuni 2016; Head 2016). In addition, in contexts where public policy accountability is low and bureaucratic turnover is frequent within short timeframes, decision-makers may lack strong incentives to act on evidence. These conditions often promote incremental reforms with limited disruptive effects (Cronin et al. 2015; Kirigia et al. 2016; Omamo 2003).

On the supply side, the credibility and legitimacy of the evidence providers are critical. This credibility stems from competence[12] and other attributes that can sometimes be overlooked by researchers, such as integrity (e.g., independence, authenticity), benevolence (commitment to the policy agenda), reputational capital built over the years, and a trusted relationship with policymakers and their networks (Cairney & Oliver 2017; Crewe & Young 2002; Haynes et al. 2012; Jones et al. 2009).

In addition, evidence providers, especially research-oriented organizations, typically use risk-averse, probabilistic language. This can alienate policymakers who respond better to value-based, opinionated, and compelling storytelling with a clear beginning, middle, and end (Cairney & Oliver 2017; Mockshell & Birner 2015). Technical factors can further complicate the messaging around policy repurposing recommendations. These include over-technicality, results that confirm common sense

[10] See for instance OCHA (2022) on the Sri Lanka food crisis related to food and agricultural policy reforms.
[11] See for instance Ratner et al. (2022), on eight case studies of multi-stakeholder platforms for natural resource governance.
[12] Competence itself derives from an expertise in specific research methods but also sectoral, cultural, and geographic-specific knowledge (McVay et al. 2016; Walker, Ryan, & Kelley 2010). Perception of competence also varies depending on the audience; for instance, some epistemic communities value qualitative or quantitative methods more (Smith & Joyce 2012b).

knowledge and lack actionable recommendations (the *''so what''* factor) (Burris et al. 2011; Walker, Ryan, & Kelley 2010), or excessive reliance on long, visually unappealing reports (Jones et al. 2009).

These barriers are compounded by the political economy of policy reform processes (see Module 5). In this political economy, stakeholders actively shape reforms by politicizing evidence in policy dialogue; they influence the supply and use of evidence to align with their preferences (Strassheim & Kettunen 2014; Walker, Ryan, & Kelley 2010). They may selectively use evidence, choosing studies or facts that support their policy position (Head 2016; Strydom et al. 2010). Stakeholders may also use evidence symbolically to bolster the legitimacy of a reform process without using the findings to inform policy (Cronin et al. 2015). Companies and community activist organizations, for lobbying and campaigning purposes, respectively, will also commission "policy-based evidence" to sway dialogue in the direction that best serves their interest (Young & Quinn 2012).

1.5.2. Enablers of an Evidence-informed Policy Dialogue

Policy dialogue participants can adopt multiple strategies to mitigate the barriers to an evidence-informed repurposing discussion, described below.

Organizations providing evidence can take measures to enhance their credibility and legitimacy. They can strive for high-quality evidence through appropriate methods, data, peer review, and the messenger's credibility. Frequent interaction with other dialogue participants, long-term country presence, mutual respect, and understanding also enhance credibility (van de Goor et al. 2017; Strydom et al. 2010; Uzochukwu et al. 2016). Co-producing evidence by involving Indigenous communities, beneficiaries, and/or policymakers in the research design and execution can also increase its legitimacy (Newman et al. 2012; Uneke et al. 2017). Policymakers, in particular, may feel unsettled when encountering research findings for the first time in a dialogue setting (Strydom et al. 2010).

Organizations providing evidence to the dialogue can also invest time in learning the organizational and institutional landscape of the reform processes they will enter or work through knowledgeable individuals, i.e., policy champions (Bowen & Zwi 2005; Resnick et al. 2015; Tilley, Shaxson, & Ball 2017). This time investment includes understanding which organizations and individuals are formally and informally making decisions about various resource allocations in the repurposing process. It also includes understanding the explicit and tacit rules governing these decisions. For instance, reforming an input subsidy program, even if formally a prerogative of the Ministry of Agriculture, might depend heavily on the President's views if there are substantial political implications tied to the program. These stakes might increase further before an upcoming election. Considering these factors or actively participating in policy processes—such as serving on advisory committees or attending planning meetings—can assist evidence providers in offering timely recommendations. It also enables them to tailor their messages to the specific audience and problem (Haynes et al. 2012; Strassheim & Kettunen 2014).

Discourse and communication also matter. Evidence providers can use policy narratives and emotional appeal, presenting research findings in a way that resonates with policy dialogue participants' worldviews. However, this comes with a trade-off: while persuasive methods may increase the effectiveness of evidence in a specific repurposing reform, they may undermine the provider's long-term credibility by raising questions about their impartiality (Cairney and Oliver 2017). Even without such methods, evidence providers can make findings more appealing by stressing how they offer new solutions to contested problems and by rooting them in the local context (Omamo 2003; Tilley, Shaxson, & Ball 2017). They can also invest in a good communication strategy, including appropriate

visual identity, an identified target audience, and strategic recourse to traditional and social media (Haynes et al. 2012; Ssengooba et al. 2011).

Finally, evidence providers can adopt an iterative and adaptive long-term approach to informing a repurposing dialogue. Policy reforms are complex processes: they are inherently political, messy, and unpredictable (Smith & Joyce 2012a; Tilley, Shaxson, & Ball 2017). Decision-making power is polycentric, involving a dynamic network of individuals and organizations responsible for designing, adopting, and implementing various components of reforms (Hill & Hupe 2021). Realistically, evidence cannot sufficiently inform repurposing through a limited number of formal dialogue events. Instead, evidence will likely be accumulated from different sources and communicated over time through many policy dialogue channels (Bowen & Zwi 2005; Huston 2008). Triggering events, such as a climatic catastrophe or a social movement, can create a window of opportunity for evidence-informed reform, provided it is politically feasible and implementable (Neilson 2001).

1.6. ASSESSING THE IMPLEMENTABILITY OF REPURPOSING STRATEGIES

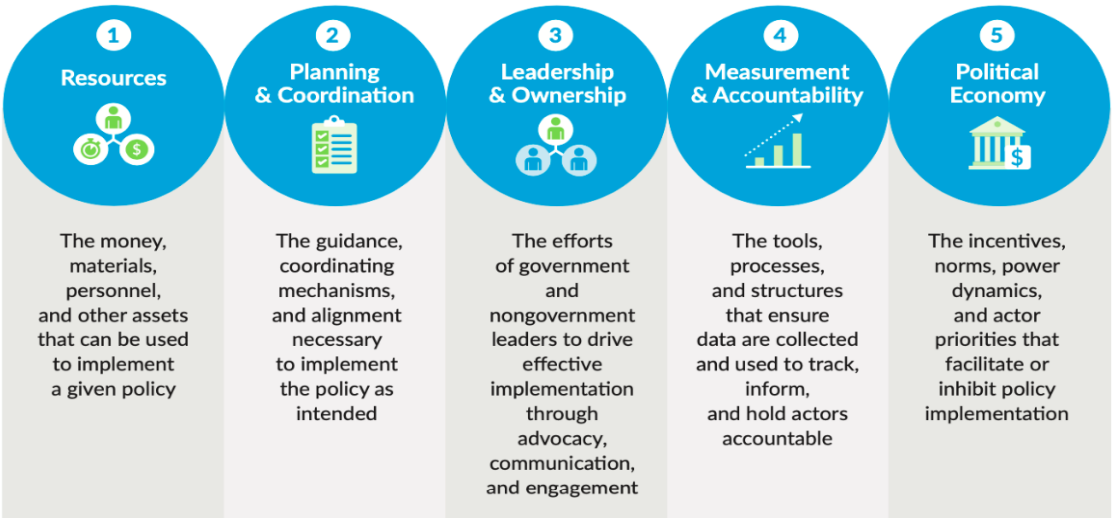
Desirable, evidence-informed repurposing reforms may be agreed upon through inclusive policy dialogue and passed through national legislation. Yet, adopting policies is just one step; implementation is essential to transform reforms into reality. When making policy decisions, it is useful to consider whether there are sufficient resources to implement the considered policy. If there are not, it would be preferable to choose another policy when setting the agenda. The following describes some methods for assessing the ease of policy implementation.

Implementing a policy reform is ''what is expected to follow once a particular goal has been formulated and decided upon, to realize the goal'' (Hill & Hupe 2021). Although policy implementation may be overlooked as a residual administrative activity of the policy process, it carries high significance: it is the series of government actions that give life to the intended policy as outputs and outcomes; in that sense, it *is* the policy (O'Toole 2000). Government action happens through multiple layers of bureaucratic sub-organizations and individuals, down to the ''street-level bureaucrats'', such as teachers, policemen, or firefighters, who have considerable latitude in executing centrally decided public policies (Lipsky 2010). In their seminal study of a federal public works program implemented in Oakland, Pressman and Wildavsky demonstrate a vast number of links in the U.S. bureaucratic chain of command, each corresponding to a decision point in policy implementation. They identify 70 such points in their case study; however, with an 80 percent probability of agreement at each point, there is zero chance of successfully implementing a central policy at the street level (Pressman & Wildavsky 1984).

Given these challenges, it is valuable to assess how the implementation of proposed repurposing reforms is likely to unfold as part of an inclusive policy dialogue. Participants in the dialogue, especially policy practitioners outside the administration, may not be well-positioned to predict the detailed pathway of reform implementation in advance. Nevertheless, they can contribute to creating an enabling environment for implementation.

The Urban Institute, a Washington DC think tank, recently produced a framework to enhance the implementability of agricultural transformation policies (Elridge, Milner, & Williams 2020). The Urban Institute Framework (UIF) identifies five domains impacting implementability: resources, planning and coordination, leadership and ownership, measurement and accountability, and political economy (Figure 1.3).

Figure 1.3: Policy Implementation Domains



Source: Elridge, Milner, and Williams 2020.

The UIF can be used to foster a dialogue around the implementability of proposed repurposing reforms to identify and mitigate glaring, foreseeable gaps that threaten them. The Urban Institute applied the framework to a hypothetical fertilizer subsidy in Sub-Saharan Africa (Table A.2). The framework's use highlights the importance of the following aspects in enhancing reform implementability, among others:

- Resources: Are there enough available to provide the amount of fertilizer needed under this policy, with a reliable distribution, at a reasonable cost? Do agriculture extension agents and other district-level actors have the resources to implement the program, e.g., enforcing targeting requirements?

- Planning and coordination: How will targeted beneficiaries be identified and reached? Are there clear guidelines and procedures for paying fertilizer suppliers? Are there clear institutional mechanisms in place to coordinate the implementation among multiple agencies involved in procurement, targeting, distribution, and payment? Are roles well defined between the government and private sector?

- Leadership and ownership: Who will champion the policy at the community, district, and regional levels? What forums exist for policy dialogue between the government and other stakeholder groups, e.g., farmers, agri-dealers, and fertilizer associations?

- Measurement and accountability: Does the fertilizer subsidy policy have a time-bound monitoring plan with specific reporting requirements? Do responsible entities audit functions on import, distribution, and beneficiary selection? How will the government assess the quality of fertilizer supplied to farmers?

- Political economy: How might the policy's political objectives impact effective subsidy targeting?

Participatory dialogue is crucial in identifying and agreeing upon development objectives and the policies needed to achieve them.[13] A key consideration in selecting policies is their ease of implementation, with those that are difficult to implement being viewed as unrealistic. Supplying policymakers and practitioners with necessary evidence is crucial for making informed decisions on which objectives to pursue and which policies to implement.

[13] The focus of this toolkit is on national policy reforms. However, some policies require international coordination as their impacts transcend boundaries and require regional or global discussion. International platforms and institutions can play an important role in this dialogue. For example, the WTO framework has shown to be influential in key successful reforms (Vos, Martin, & Resnick 2022).

MODULE 2: PUBLIC EXPENDITURES ON AGRICULTURE

Monitoring agricultural policies and their effects is crucial in helping decision-makers make better-informed choices for their agricultural and food policies. Evaluating how much support is provided to the agricultural sector and in which form is essential for identifying gaps, priorities, and the need for repurposing resources and policies to boost agricultural transformation and food security. Monitoring policies makes it possible to assess whether they are coherent, mutually reinforcing, or misaligned with strategic government objectives.

Governments can influence the development of the agrifood sector through various public policies, as described in Figure I.1 of the Introduction. Key policies are fiscal support, including subsidies and expenditure on agrifood services, and price incentives (or support) generated by market and trade policies. This module describes how to analyze public spending, and Module 3 describes price incentive methodologies. Monitoring both types of policies in core diagnostics is important to fully grasp government agricultural support. While these policies are interconnected and sometimes combined in indicators, this toolkit treats the methodologies separately due to their distinct implementation steps, allowing for incremental or modular deployment.

It is important to highlight that the theoretical guidelines presented in Modules 2 and 3 are based on internationally recognized methodologies used by different initiatives and organizations to measure agricultural policy support. These initiatives include the OECD, FAO, Inter-American Development Bank (IADB), and World Bank. In 2015, these organizations collaborated with IFPRI to form the International Organization Consortium for Measuring the Policy Environment for Agriculture, usually called the Ag-Incentives Consortium. The Ag-Incentives Consortium produces and regularly updates the Ag-Incentives database for many countries (Box 2.1), following a harmonized methodology that represents a synthesis of the OECD and FAO/MAFAP methodologies, as briefly discussed below.

The OECD policy monitoring methodology (OECD 2016)—usually referred to as the Producer Support Estimate (PSE) methodology—represents the first attempt to monitor agricultural policies systematically, consistently, and at a large scale. Its core objectives were to monitor and evaluate developments of agricultural policies, establish a common base for policy dialogue, and build agricultural support data that could be used in modeling to assess policies' effectiveness and efficiency in delivering their intended outcomes (OECD 2016).

The FAO/MAFAP policy monitoring methodology builds on the OECD PSE framework but also borrows definitions and indicators from studies on agricultural pricing policies and policy distortions carried out by the World Bank since the 1990s (e.g., Krueger, Schiff, and Valdés, 1992, 1991).[14] Since 2009, the FAO/MAFAP program has worked with governments and national policy research institutes, mainly in African countries, to replicate the policy monitoring and evaluation efforts of OECD in developing countries. The MAFAP approach has been adapted to fit better the needs of low-income countries, where price distortions are not always determined by policies but often by market inefficiencies, and to account for data scarcity in these contexts.

The OECD and the MAFAP methodologies produce a set of comparable core indicators of policy support for agriculture. The MAFAP methodology allows the generation of additional indicators that can potentially inform the repurposing agenda, including the following:

- Agriculture-supportive expenditure indicators, which measure rural expenditure.

[14] For further details, see Josling and Valdes (2004) which presents some history of agricultural policy support indicators and discusses the initial FAO approach to collect, analyze and monitor agricultural policy indicators in developing countries.

- Indicators of budget execution rate, source of funding (national vs. donor funds), and the nature of the expenditures (recurrent expenditures vs. capital investments) through public expenditure review.
- Price incentive indicators, specifically the NRP, at three points of the value chain, i.e., not only at the farm gate but also at the wholesale and retail level.
- Indicators of price distortions arising from market failures and underdeveloped infrastructure, such as the Market Development Gap indicator (MDG).

This toolkit provides guidance using the MAFAP approach, as it can be more comprehensive and adaptable to the developing country context. Moreover, the methodology is introduced in a modular and incremental fashion, giving users the flexibility to expand the analysis beyond the core indicators if needed. Lastly, the MAFAP policy monitoring approaches follow the indicators' nomenclature and definitions of the Ag-Incentives Consortium methodology. Its definitions are broadly consistent with internationally recognized classifications, such as the Classification of the Functions of Government (COFOG) for public expenditure. This module and Module 3 provide more details on the available methodologies for measuring agricultural policy support, including their similarities and complementarities.

Box 2.1: Ag-Incentives and the International Organizations Consortium for Measuring the Policy Environment in Agriculture

In 2013, the most important international organizations involved in the monitoring of agricultural policies, namely the IADB, the IFPRI, the Food and Agriculture Organization of the United Nations through its MAFAP Programme (FAO-MAFAP), the OECD, and the World Bank formed the Ag-Incentives Consortium. The initiative aims to compile a comprehensive global database of agricultural policy support indicators, including the NRP and NRA. In the years with the greatest coverage, this dataset covers the period 2005–2021 for over 70 countries (considering all European Union members as a single country) that account for nearly 90 percent of the global value of agricultural production.

Within the Ag-Incentives Consortium, OECD produces policy support indicators for OECD countries, non-OECD EU Member States, and some emerging economies: Argentina, Brazil, China, Colombia, Costa Rica, India, Indonesia, Kazakhstan, the Philippines, Russian Federation, South Africa, Ukraine, and Viet Nam. The IADB covers most of the remaining countries in Latin America and the Caribbean; the FAO monitors selected Sub-Saharan African countries. At the same time, the World Bank has produced indicators for Sri Lanka and Pakistan. IFPRI harmonizes and aggregates data from the various partner organizations using the standard NRP methodology.

These data provided inputs for important analysis and were featured in flagship studies on global trends of support to agriculture to inform policy prioritization and reform. Studies include "A multi-billion-dollar opportunity – Repurposing agricultural support to transform food systems" (FAO, UNDP, & UNEP 2021); "The State of Food Security and Nutrition in the World 2022" (FAO, IFAD, UNICEF, WFP, & WHO 2022); "Repurposing Agricultural Policies and Support: Options to Transform Agriculture and Food Systems to Better Serve the Health of People, Economies, and the Planet" (Gauthan et al. 2022); and "Transforming Agriculture in Africa & Asia: What are the Policy Priorities?" (Laborde et al. 2019).

2.1. MEASURING PUBLIC EXPENDITURES ON AGRICULTURE

2.1.1. Why Monitor Public Expenditure on Agriculture

Evidence shows that investing in the agricultural sector effectively reduces poverty (Ligon & Sadoulet 2018; Dorosh & Thurlow 2018; Mogues et al. 2012; World Development Report 2008). Poverty reduction also requires investing in agricultural R&D while addressing the lack of rural infrastructure and market failures, such as information asymmetry and imbalanced market power (Mogues et al. 2012). Nevertheless, to realize these outcomes, expenditure must be sufficient and of the right initiative type, e.g., agricultural research, extension, irrigation, feeder roads, agricultural input subsidies, and others. Spending must also be appropriately distributed across geographic areas to reduce poverty. It must balance capital investment for long-term growth against recurrent expenditures to cover salaries and other costs of providing public services. Finally, efficient design and implementation of the support programs and timely provision of funds are needed.

Investment in the agricultural sector is particularly important in developing countries, where it is the mainstay of the economies and often the largest sector in terms of GDP and employment. For instance, in recent years, agriculture has accounted for nearly 30 percent or more of the GDP in some developing countries in Sub-Saharan Africa and Asia, including Cambodia, Chad, Comoros, Ethiopia, Lao, Mali, and Syria (World Bank 2021; IFAD 2016). Agricultural transformation involving the movement of labor out of agriculture into industry is one way for such agriculture-dependent countries to realize significant economic growth. Although governments have recognized that public expenditure is pivotal to accelerating agricultural transformation and have pledged to invest more in agriculture, several sector areas remain underfunded, limiting their development potential. This factor is especially true in Sub-Saharan Africa, where the share of public spending on agriculture is declining (ReSAKSS 2021).

Optimal Spending on Agriculture

Determining the government budget allocation to the agricultural sector is crucial for practitioners and policymakers. However, there is no specific optimal spending level that countries need to achieve. The decision on how much to allocate to the sector needs to be motivated by local context, development challenges and objectives, and the relative returns to investment across different sectors. Hence, the final share of the budget allocated to agriculture should be motivated by what is socially and economically optimal rather than arbitrary rules of thumb. However, it is often difficult to conduct detailed and precise analyses to estimate returns to investments due to data limitations. Under such circumstances, one option is to examine the spending levels of peer countries and use it as a guide by evaluating their success in achieving agricultural transformation, poverty reduction, improved food security, and nutrition (Goyal & Nash 2017).

The African Union CAADP target of spending at least 10 percent of the public budget on agriculture was set using similar principles following the experience of some countries during the Green Revolution and research estimates on how much public agricultural spending would be needed to attain a 6 percent agricultural growth. This goal could significantly cut hunger in Africa (Inter-Réseaux Développement Rural and SOS Faim 2013). Despite this commitment, Africa-wide, the share of government spending on agriculture averaged just 2.4 percent for the period 2015–2020, which is well below the 10 percent CAADP target and even followed a declining trend in recent years (ReSAKSS 2021; Pernechele et al. 2021).

However, budget allocation is only one side of the coin, as investment returns also depend on how effectively and efficiently the money is spent. The composition of government spending on agriculture

is as important as the amount spent. Empirical evidence suggests that returns on some types of investment are higher than others. Spending on public goods, especially R&D and extension services and off-farm irrigation, has a higher payoff than private goods, such as input subsidies (Mogues et al. 2012; Fan et al. 2018; Nin-Pratt & Magalhaes 2018). Hence, it is important to take into account the difference in returns across various forms of agricultural support instruments (Sánchez & Cicowiez 2022b) and their strength of linkages with the rest of the economy (Sánchez, Cicowiez, & Ortega 2022) when considering repurposing options.

Initiatives Measuring Public Expenditure on Agriculture

Beyond the OECD and FAO initiatives for tracking public spending in agriculture, numerous other databases and initiatives have variations in the objective, scope, and definition of agriculture sectoral spending.[15] The most well-known databases include ReSAKSS, SPEED, ASTI, the World Bank's AgPERs, the IDS/CRS database, and FAO's Government Expenditure on Agriculture (GEA) database.[16] These initiatives interact in three fields: (a) holding governments to the commitments they have made toward supporting the agriculture sector, for example, the CAADP target in which African states agreed to allocate at least 10 percent of total public expenditures to the agriculture sector; (b) improving aid effectiveness of agriculture sector funding; and (c) supporting and promoting evidence-based policymaking. These initiatives differ in nature, objective(s), scope, and method. Therefore, these initiatives should be understood as different tools responding to specific but complementary needs at the country and regional levels. These approaches are well-suited for comparing public expenditures across countries but generally disregard how the money is spent (i.e., the spending composition) and lack the level of detail for closer analysis at the country level.

The rest of this toolkit focuses on country-level analysis to help determine how to repurpose policies for a healthier, more equitable, and more sustainable future.

2.1.2. Country-level Analysis: Public Expenditure Reviews

Among the initiatives mentioned above, the World Bank[17] and FAO, mainly through its MAFAP program, regularly undertake agricultural public expenditure reviews (AgPERs). The main objective of an AgPER is often to inform decision-making regarding the levels and composition of public expenditure. AgPERs also consider how spending aligns with sectoral objectives and numerous goals, including agricultural growth and development, conservation of natural resources, and mitigation and adaptation to climate change. AgPERs also help governments identify ways to improve existing medium- and long-term plans to speed progress toward their policy objectives.

Types of AgPER vary by both breadth (thematic and institutional coverage) and depth (flow of funds and impact) of analysis (FAO 2015b; World Bank 2011). AgPERs can include the following:

[15] A detailed review of these various methodologies is available in FAO (2015).

[16] RESAKSS is the Regional Strategic Analysis and Knowledge Support System, facilitated by IFPRI; SPEED is the Statistics of Public Expenditure for Economic Development, a database maintained by IFPRI, and ASTI is the Agricultural Science and Technology Indicators initiative, also led by IFPRI. IDS/CRS stands for International Development Statistics/Creditor Reporting System database, which is maintained by the Organization for Economic Cooperation and Development, while GEA is the Government Expenditure on Agriculture database managed by FAO.

[17] The World Bank supports PEA studies that generate AgPERs through three channels and funding sources: the "Strengthening National Comprehensive Agricultural Public Expenditure in Sub-2.2 Africa" (SNCAPE) program, the World Bank/DFID "Public Expenditures for Pro-Poor Agricultural Growth" (PEPPAG) project and "free-standing" AgPERs. More details on the World Bank's approach are available at this publication: https://openknowledge.worldbank.org/bitstream/handle/10986/2822/600150SR0White00ESW110AgPER0Toolkit.pdf?sequence=1&isAllowed=y

- **Comprehensive review** (extensive breadth and depth of analysis): A sector-wide AgPER often carried out periodically with detailed analysis;
- **Rapid review** (extensive breadth but fairly limited depth): Conducted as a quick review to deepen policy dialogue, frame strategic action plans, guide agricultural project preparations, contribute to broader multisectoral reviews, or as part of a more frequent review process in support of a country's annual budget cycle;
- **Thematic review** (limited breadth, but extensive depth): Carried out on a specific issue, program, or subsector; can take the form of either a comprehensive or rapid review of a particular thematic area.

AgPERs are carried out at national and/or subnational levels based on the different levels of government within a country. For example, a complete AgPER in a federal government such as Ethiopia would involve reviewing public spending at the federal, regional, and woreda levels of government. In a unitary system of government, where the central government finances most projects/programs, district-level expenditures often exist due to the decentralization process, which is ongoing in many countries. For example, in Uganda, local governments partly fund and implement the National Agricultural Advisory Services (NAADS) (MAFAP 2015b).

AgPERs can be conducted annually or periodically. Annual AgPERs typically evaluate whether the budget allocation aligns with the national development strategy and investments and how this has changed from the previous years. Annual AgPERs also capture budget execution rates considering actual expenditure vs. budgeted expenditure and assess how the execution rate has changed from the previous years. In contrast, periodic AgPERs involve detailed efficiency analysis, such as cost efficiency, impact evaluation, public expenditure tracking surveys, and incidence analysis. Increasingly common are also reviews, which include environmental and climate change issues, food security, and nutrition concerns.

The choice of appropriate AgPER depends on the need, the time frame for the analysis, and the available budget, which are all decided during the AgPER preparation phase. It is best to conduct more inclusive, broader AgPERs for better-informed policy decisions.

Preparation Phase of an AgPER

Key issues to consider when preparing AgPERs include the analysis's objective and scope, type, source of data, budget, and time frame.[18] AgPER objectives should reflect the need, demand, and intended use of the analysis. The scope of an AgPER refers to coverage in terms of themes, institutions, and funding sources included in the analysis. More specifically, these three components are as follows:

- **Thematic coverage** defines which subsectors to include in the analysis. A comprehensive sector-wide expenditure review should start by defining agriculture's different subsectors. According to the United Nations Classification of the Functions of Government (COFOG), agriculture comprises four main subsectors: crops, livestock, forestry and hunting, and fisheries. Using a common definition of agriculture across countries allows for more accurate cross-country comparisons of public expenditure. Narrower thematic expenditure reviews often focus on subsectors like crops or livestock, types of spending, such as fertilizer subsidies

[18] See the Practitioner's Toolkit for Agriculture Public Expenditure Analysis of the World Bank for further details on the various preparations steps for a public expenditure review: https://openknowledge.worldbank.org/bitstream/handle/10986/2822/600150SR0White00ESW110AgPER0Toolkit.pdf?sequence=1&isAllowed=y

or irrigation infrastructure investment, or cross-cutting themes, such as natural resource management.

- **Institutional coverage** defines which public establishments to include in the analysis. A wide spectrum of public institutions is usually involved in food and agricultural budgeting and spending, resulting in multiple data sources. Most agriculture-specific expenditures will be part of the Ministry of Agriculture's budget. However, many expenditures relevant to agricultural development may refer to other ministries. For example, rural infrastructure or large irrigation programs might be financed through the Ministry of Infrastructure or Ministry of Water. Access to electricity programs might be financed through the Ministry of Agriculture. School feeding programs will often be financed by the Ministry of Education or Health rather than the Ministry of Agriculture. A robust AgPER covers all expenditures related to agriculture, even those financed outside of the Ministry of Agriculture.

- **Source of funding** refers to what sources of expenditure the AgPER should include. The different sources include national, donor, and on- and off-budget sources. The government finances national expenditures, while donor expenditures are financed by external partners such as the World Bank. Donor expenditures can be traced directly from the Ministry of Finance, Ministry of Agriculture, and implementing ministries in charge of projects/programs directly or indirectly related to food and agriculture. On-budget expenditures refer to national and donor expenditures financed through the state budget. These expenditures can be traced directly from government implementing ministries and institutions. In contrast, off-budget financing refers to expenditures not funded through the state budget. They include, for example, donor funds that do not go through the state financial system when implementing a project or program in a country. Information on this type of expenditure can be obtained by directly contacting donors through the relevant government focal point to obtain budget statements. Classifying public expenditures according to source allows comparison of budget allocations and spending by each source to establish the efficiency of public expenditures and the importance of aid.

When deciding on the objectives and scope of an AgPER during the preparatory phase, a team should consider the types and sources of data needed, including their availability. These two factors help determine the scope and quality of the analysis. An AgPER requires both quantitative and qualitative data:

- Quantitative data are mainly total government budget and expenditures, which are essential to analyze the share of total public expenditure allocated to agriculture, actual disbursement, and disaggregated allocations and expenditures on activities within agriculture-related projects and programs. Quantitative data are mainly on-budget expenditures, with minimum off-budget expenditures.

- Qualitative data describe the budget process and function and the programs, projects, and activities that constitute the analyzed public expenditure.

Data sources for public expenditure in developing countries are mainly government entities and donor organizations. Government sources of information are the Ministry of Finance and line ministries, including ministries of agriculture, livestock, infrastructure, energy, or equivalent governmental entities, depending on the government's structure. Sources also include the designated statistical branch of the government, parastatals, and other government institutions. Donor sources include the IMF's Government Finance Statistics database, the IMF Article IV reports, and the World Bank Benchmarking Operational Efficiency in Service Delivery (BOOST) database.

2.1.3. Key Public Spending Indicators and Data Needs

Various indicators are used to analyze the level and composition of public expenditure on agriculture in a given country. These indicators allow us to take stock of the level of spending and its composition and assess the coherence of budgetary policies and allocations against government strategic objectives. They can also be used for policy evaluation, such as estimating the effect of expenditure on agricultural development, agricultural growth, poverty reduction, and other development objectives. Furthermore, these indicators serve as data input to model simulation to identify the effects of potential budget reallocations on various outcomes of interest.

In absolute terms, the most common indicators of **public agricultural spending** include agricultural expenditure as a share of the total public budget or GDP. Execution rates are also key to assessing the proportion of budgeted expenditure spent and as a proxy for government capacity to execute expenditure.

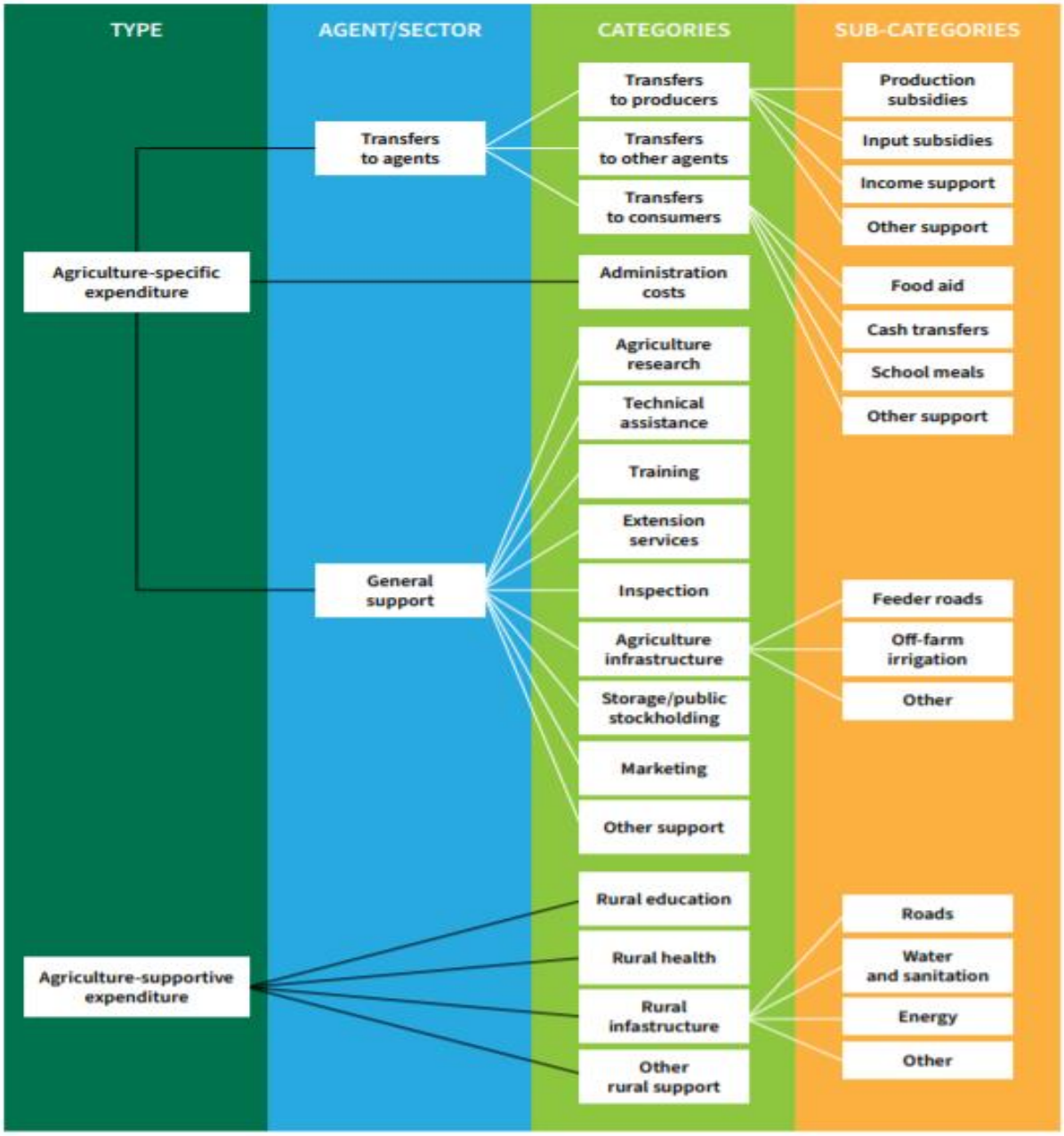
Indicators of agricultural **public expenditure composition** produced for an AgPER usually include the following:

- Indicators of functional composition of spending (Figure 2.1), which provide a breakdown of expenditures by type or function:
    - Indicators of payments (or transfers) to agents in the agricultural sector, especially producers (e.g., input subsidies, irrigation, agricultural research), but can also include consumers, traders, transporters, and input suppliers.
    - Indicators of general support expenditures that benefit the sector in the form of public goods rather than a specific agent, for example, through the provision of extension services, research, or marketing facilities.
    - Estimate of administrative costs that are linked to policy formulation and coordination and running costs of ministries and other public entities and indicators of agriculture-supportive expenditures that do not directly relate to agriculture but support rural development more broadly, e.g., rural roads, education, and health.[19]
- Indicators of spending by sector (e.g., crop, livestock, forestry, and fisheries), subsector (e.g., cereals, cash crops, etc.), or commodity, where possible (e.g., cotton, rice, cattle).
- If data permits, indicators of the geographical composition of spending can be identified by identifying the geographical area where expenditure is executed.
- Indicators of capital vs. recurrent expenditures (economic classification).

Additional public expenditure analysis can look at the **source of funding** for agricultural expenditure using indicators, such as the amount of total expenditure by donors on agriculture or its share in the total agriculture expenditure and each functional category, compared to the share of national funding. Analyzing how the donor funds are channeled into agriculture through loans or aid is possible if data permits.

[19] These are additional indicators produced through the FAO/MAFAP methodology and should be seen as complementary to the analysis of agricultural-specific spending, if data allow their computation. When it is not possible to collect or classify data on agricultural-supportive spending properly, this segment of the analysis is dropped.

Figure 2.1: Classification of Public Expenditure



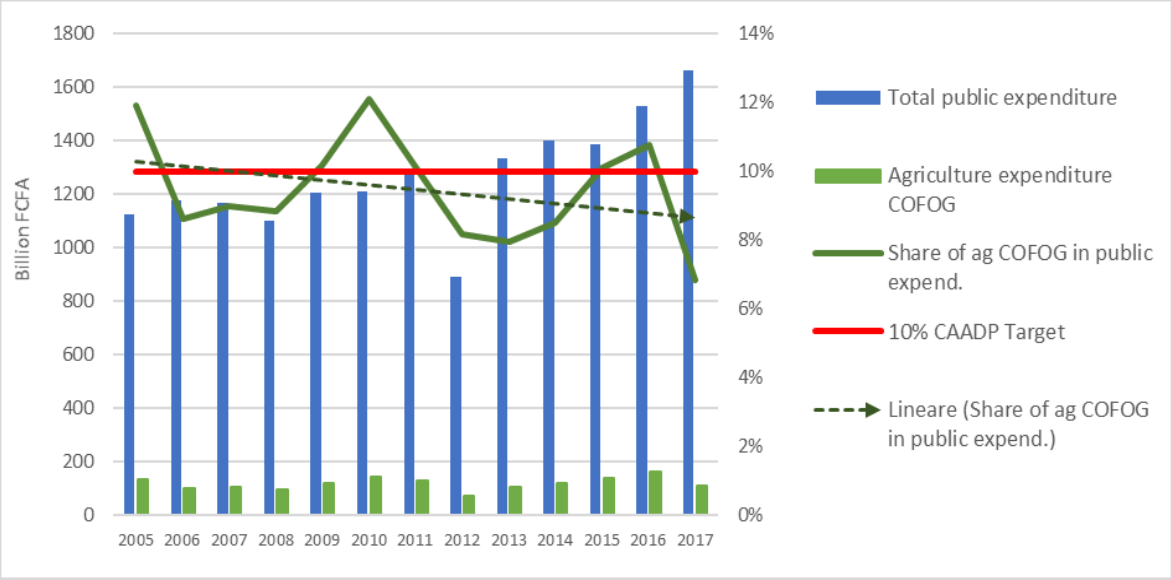
Source: MAFAP 2015.

Box 2.2 presents an example of public expenditure indicators produced in Mali through the MAFAP methodology.

Box 2.2: Trends of Public Expenditure on Agriculture in Mali and coherence against key strategic objectives

According to the public expenditure analysis in Mali (Nkuingoua & Pernechele 2022), the total annual public expenditure on agriculture averaged 119 billion FCFA, using a definition compatible with COFOG (Figure 2.2). The CAADP target of allocating at least 10 percent of public expenditure to agriculture was met only in 6 out of 13 years from 2005–2017. Furthermore, the trend has been erratic and downward, declining from 12 percent in 2005 to 9 percent in 2006, peaking at 12 percent in 2010, then dropping to 7 percent in 2017.

Figure 2.2: Agricultural Public Expenditure in Mali

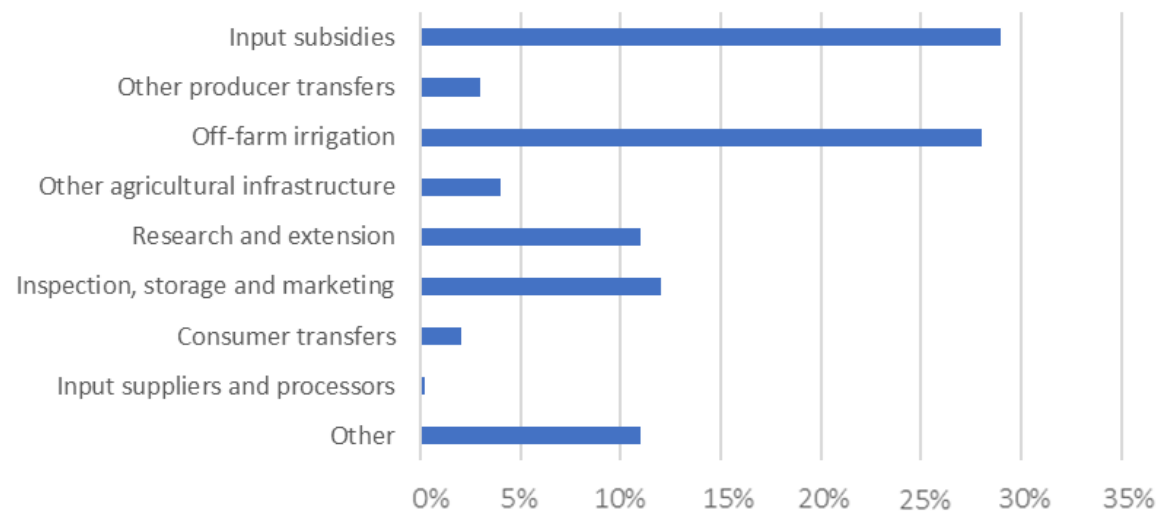


Source: MAFAP 2021.

The PNSIA, Mali's main agricultural policy document, viewed infrastructure development and technology as the engine of agricultural growth. However, agricultural spending is increasingly focused on input subsidies, while spending on transport and market infrastructure, research, and extension services remains low and even declining in some cases. Figure 2.3 presents the composition of public expenditure on agriculture and illustrates that spending in Mali largely focuses on providing variable input subsidies and off-farm irrigation. These jointly account for over 55 percent of agricultural expenditures from 2005–2017. Funding for other services, such as research and extension, only received around 10 percent of all agricultural spending.

Moreover, although the government aims to pursue agricultural diversification, as indicated in the PNSIA, more than 70 percent of public expenditure is allocated to cotton and rice. Other priority commodities such as livestock, maize, millet, peaches, and sorghum have received less attention.

Figure 2.3: Average Composition of Agricultural PE in Mali, 2005–2017



Source: MAFAP 2021.

Funding source analysis reveals that the agricultural sector in Mali relies heavily on donor funds, accounting on average for 57 percent of the food and agriculture budget (see Figure 2.4). This factor contributes to the volatile expenditure trend since donor priorities and funds can change rapidly.

Figure 2.4: Funding for Food and Agriculture by Source

	2005	2006	2007	2008	2009	2010	2011	2013	2014	2015	2016
National	35%	27%	30%	37%	43%	51%	49%	65%	54%	42%	46%
Donor	65%	73%	70%	63%	57%	49%	51%	35%	46%	58%	54%

Source: MAFAP 2021.

Source: Nkuingoua and Pernechele 2022.

Data Sources and Requirements for MAFAP PEA Analysis

The expenditures considered in the FAO/MAFAP approach are all budgetary transfers that broadly support agriculture, considering both agriculture-specific and supportive expenditures. These include full on-budget expenditure data at the central and, if possible, decentralized (subnational) levels that help identify the share of total expenditure allocated to the agricultural sector. In addition,

disaggregated expenditures on activities across projects and programs are required for the composition analysis.

Ideally, off-budget expenditure should be collected, but this has often proved very difficult, as this data is usually not well systematized and stored. Therefore, collecting on-budget data is prioritized. Data should cover all public financing institutions, whether nationally or donor-sourced, and all financing instruments.

In a nutshell, the data classified and analyzed following the FAO/MAFAP approach should ideally cover the following:

- At least full national on-budget expenditure and, if possible, subnational (decentralized) expenditure
- National and donor expenditure
- Budgeted and actual expenditure
- Current and capital expenditure[20]

Data sources are usually the Ministry of Finance and/or various line ministries, potentially including the ministries of agriculture, livestock, water, infrastructure, rural development, or food security. Financial auditing offices, central banks, national bureaus of statistics, and local institutions should also be considered. Data from parastatals, social security funds, or financial corporations related to the food and agricultural sector may also be explored.

Value and Use of PEA Data

The data and indicators obtained following this methodological framework are key to measuring the level and composition of government spending on food and agriculture and reviewing the coherence of spending against government priorities and objectives. This is also critical, as data input, to simulate the impact of different investment options and to assess how efficient different types of expenditure could be, using, for instance, CGE modeling tools, as presented in Module 4.

This methodology can also be adapted to different monitoring objectives, such as analyzing food security and nutrition expenditures.[21] In addition, the MAFAP approach is also consistent with that used by COFOG, the most used public finance classification framework, making indicators produced through this method broadly comparable across countries and databases (see Box 2.3).

[20] In the absence of detailed information on donor expenditures, on actual as and on current vs. capital expenditures, the PEA will be partial. Some assumptions can be made to derive proxies on a case-by-case basis, e.g., apply donor/national shares in years for which data is available to years that lack this info, but analysis limitations and caveats should be acknowledged and well explained.

[21] For more info on the analytical framework on public expenditure towards food security and nutrition developed by MAFAP see the following publication: https://www.fao.org/3/i6215e/i6215e.pdf

Box 2.3: MAFAP Public Expenditure Classification and COFOG

Most governments use COFOG to report their public spending, or COFOG+ when reporting to the African Union. The MAFAP aggregate agriculture-specific expenditures, including administrative costs and excluding consumer transfers, capture most of what is captured in COFOG (as per the Government Finance Statistics (GFS) manual 2014). However, there are two important aspects where there may be slight inconsistencies. The first occurs when COFOG is not applied consistently at the country level, as Mogues and Caceres (2018) highlighted. In such cases, COFOG aggregates might be inconsistent with MAFAP aggregates. Secondly, there are four important instances where the MAFAP classification deviates from COFOG. These are mostly in ways consistent with the methodological guidance provided by the African Union to track the expenditures against the 10 percent Malabo declaration. These four areas are as follows:

a) Treatment of hunting-related expenditures: The original COFOG classification covers expenditures related to commercial hunting and hunting for sport; in the overwhelming majority of cases, these expenditures are excluded from the MAFAP classification perimeter.

b) Treatment of agricultural R&D: In COFOG, R&D expenditures related to agriculture are usually classified in a separate category (70482 R&D agriculture, forestry, fishing, and hunting), while in the MAFAP classification, these expenditures are usually classified as agriculture-specific unless they relate to hunting.

c) Multipurpose projects: These include integrated facilities for the generation of power, flood control, irrigation, navigation, and recreation. For such projects, usually classified under "70474 Multipurpose development projects" in COFOG, MAFAP generally attributes weights based on the relative importance of each purpose or function (or equal weights when information on the relative importance is not provided).

d) Expenditures related to forestry and land management: MAFAP is generally quite consistent with COFOG regarding forestry and land management expenditures by excluding all forest and land-related expenditures that are explicitly for forest conservation and biodiversity preservation. However, in cases where the main function of forestry and/or land management-related expenditures is unclear (e.g., reforestation), the MAFAP approach normally considers these to be agricultural.

As a result of these differences, the agricultural public expenditure aggregates obtained by MAFAP could be slightly different from those obtained when using COFOG.

The MAFAP classification adds valuable information on the composition of public expenditures in terms of the functional composition (what kind of expenditures) and the nature of the goods purchased with these expenditures funds (private vs. public). This is a key reason why the MAFAP public expenditure aggregates have been used to support several World Bank AgPER light (e.g., Mali) or agricultural public sector reviews (e.g., Uganda) and analyses of agricultural incentives (e.g., Angola and Mozambique).

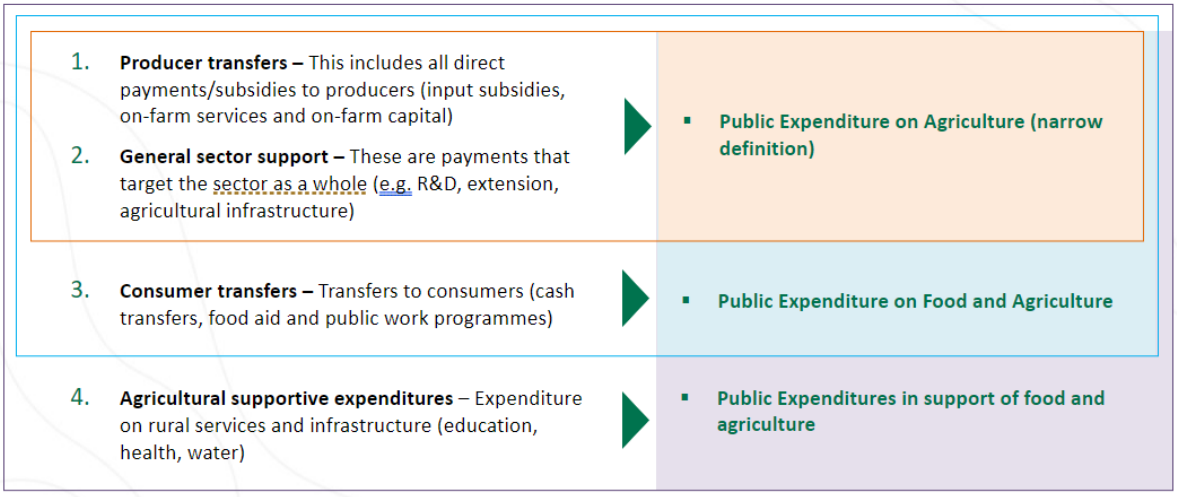
Yet, apart from monitoring levels, the significant advantage of detailed expenditure classification methodologies lies in their ability to use modeling tools. This enables the generation of evidence regarding the simulated benefits of repurposing agricultural expenditures (see Module 4). Specifically, any simulated impacts of agriculture public expenditure should go beyond just focusing

on levels (Sánchez & Cicowiez, 2022b). It is difficult to provide recommendations for improvements in composition without analyzing public expenditure composition.

2.2. GUIDE FOR CALCULATING PUBLIC EXPENDITURE INDICATORS

This section provides guidance on implementing the public expenditure analysis methodology. As discussed above, the toolkit follows FAO's MAFAP methodology[22] unless otherwise specified. MAFAP is similar to but broader than the OECD methodology as it includes agriculture-specific programs and supportive measures (Figure 2.5). Given the importance of these expenditures in developing countries, these additional indicators can be quite informative and should be included in the AgPER where possible, data allowing.

Figure 2.5: Key Aggregated Indicators of Public Expenditure



In addition to indicators tracking the **level of public expenditure** on food and agriculture, using these different aggregates, it is also possible to estimate:

- Shares of public expenditure on food and agriculture, most often, over the total budget of the government
- Intensity of public expenditure, which could be per capita or related to ag GDP, for example
- Indicators of the **source of funding,** by donor or national, that can also be computed by category
- **Indicators of execution of public expenditure,** including overall execution rate (actual spending over budgeted) and execution rate by functional category.

Indicators of the **composition of public expenditure** on food and agriculture can relate to:

[22] A detailed and fully fledged interactive course on the FAO/MAFAP public expenditure methodology is available online at: https://elearning.fao.org/course/view.php?id=705

- **Functional composition,** expressed in level and as a share of total **expenditure** on food and agriculture, would also allow comparison of different spending shares, e.g., spending on private vs public goods or general services
- **Sectoral composition** (expenditure by sector, group of products, or single products)
- **Geographic composition,** including ag expenditure by region and share of subnational expenditure
- **Economic composition of expenditure (recurrent vs capital),** which is possible if the raw data contained that information, i.e., on GFS classification

2.2.1. Data Collection and Preparation

The process for estimating indicators of public expenditures to the agriculture sector can be summarized as follows:

1. **Identify the relevant national and subnational government agencies that may have data on expenditures and transfers to the food and agriculture sector**. The process for obtaining data on public expenditures in the sector starts by identifying the relevant agencies in charge of executing or keeping administrative records on expenditures in the agriculture sector. Ideally, the Ministry of Finance or Planning should own the full financial data needed for the analysis, which would be the best option for effective data access. If it is impossible to retrieve the full expenditure dataset from these institutions, all the public agencies relevant to the food and agriculture sector (national and subnational, depending on the administrative arrangement of the country) should be approached. During this process building a good working relationship with contact persons in those agencies is important as they will be crucial for determining the functional objectives of public expenditure.

2. **Collect budgetary allocations to the sector from relevant agencies.** Once the agencies have been identified, analysts should collect data from budget books and financial reports from those agencies and agrifood-related budget lines at the lowest level of disaggregation possible. If possible, data should be identified from the activity level and with information on commodities supported by each measure. In most countries, the Ministry of Finance produces and maintains budget books, financial reports, and related datasets required for expenditure analysis. Public expenditure data can be retrieved from different formats:

    a) Documents, reports, or databases that could be in Excel or PDF format. These items contain information on how expenditures were allocated across various ministries in a given period. These budget books, financial reports, and related datasets often have high specificity and incorporate multiple classifications or markers (e.g., economic classification, COFOG, GFS, and administrative and geographical markers).
    b) National inventories of projects and programs in the agricultural sector.
    c) Inventories of projects and programs managed by development partners and donors.
    d) Initiatives dedicated to monitoring public expenditure (as briefly listed in section 2.1), including the useful BOOST database managed by the World Bank, which contains project-level data very useful for the MAFAP classification.

    In this phase, capturing, if possible, the **budgeted (or planned) spending and the executed amounts** (i.e., actually realized) is critical. Planned spending at the beginning of the fiscal year is often not fully executed at the end. This may be due to one or more reasons, such as emergencies or redistributed spending determined by authorities during the fiscal year. Computing budget

execution rates can enrich the analysis, which is always recommended. The analysis of executed expenditure provides a more realistic picture of how the government has supported the sector. However, when the analysis of the expenditure executed is not yet available, the planned expenditure can be used on a preliminary basis.

3. **Systematize raw data needs to be clean and in Excel format**, making sure items are not double counted or repeated at different levels of disaggregation and that all possible already existing additional information, such as classifiers or expenditure identifiers, are kept.

4. **Stocktaking of the food and agriculture programs in the country**. Gather qualitative information on the main programmes related to the food and agricultural sector, including their objectives, target population, eligibility criteria, and commodities supported. This information is key to guiding an effective classification of expenditure. In most cases, the rules for participating in those programs are documented in publicly available websites or repositories. However, it is possible to gather complementary data through physical documents or interviews with key actors related to each program. This exercise is critical for correctly tagging expenditures under a program, especially when programs are not narrowly defined. For example, a single program may include subsidies of various types (on inputs, output, etc.), in which case, interviews with program managers or other secondary data available may provide the key qualitative data to make an informed decision on the classification of such programs.

5. **Classify projects/programs/expenditures into functional subcategories**. After data collection, the key step is tagging expenditures to the functional categories reported in Table 2.1, using the information collected in point 4. Key classification principles and guidelines are detailed in the following section, 2.2.1. Table 2.1 defines the categories shown in the schematic version of the MAFAP classification in the previous chapter.

Table 2.1: Functional Classification of food and agricultural projects and expenditure

Target	**Subcategory**	**Definition**
Agricultural specific expenditure		
Producer	A. Production subsidies based on outputs	Transfers to agricultural producers based on the output of a specific agricultural commodity
	B. Production subsidies based on outputs	Transfers to agricultural producers based on the on-farm use of inputs
	B1. Variable inputs	Transfers that reduce the on-farm cost of a specific variable input. Includes seeds, fertilizer, energy, credit, and others
	B2. Capital	Transfers that reduce the on-farm investment cost of farm buildings, equipment, plantations, irrigation, drainage, and soil improvements
	B3. On-farm services	Transfers that reduce the cost of on-farm technical assistance and training
	C. Income support	Transfers to agricultural producers based on their level of income
	D. Non-classified (producers)	Transfers to agricultural producers individually for which there is insufficient information to allocate them into the above-listed categories
Consumer	E. Food aid	Transfers to consumers to reduce the cost of food
	F. Cash transfers	Transfers to consumers to increase their food consumption expenditure
	G. School food programs	Transfers to consumers to provide free or reduced-cost food in schools
	H. Non-classified (consumers)	Transfers to consumers individually for which there is insufficient information to allocate them to the above-listed categories
Other agents	Payments to input suppliers	Transfers to suppliers of agricultural inputs
	Payments to transporters	Transfers to transporters

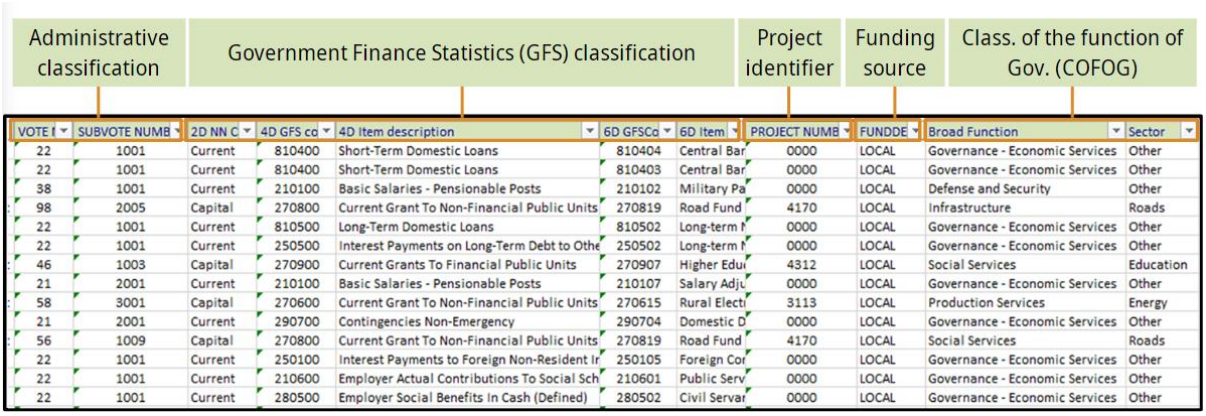
	Payments to traders	Transfers to traders
	Payments to other agents	Transfers to other agents in the agricultural sector
Sector	I. Agricultural research	Public expenditure for research activities to support agricultural production
	J. Technical assistance	Public expenditure for agricultural extension, which includes expenditure for providing a) technical assistance, b) training, c) extension services, and d) control of quality and safety of food and agricultural inputs.
	K. Training	
	L. Extension	
	M. Inspection	
	N. Agricultural infrastructure	Public expenditure for agricultural infrastructure
	N1. Feeder roads	Public expenditure to finance feeder roads
	N2. Irrigation	Public expenditure to finance off-farm irrigation
	N3. Other	Public expenditure to finance other off-farm infrastructure
	O. Storage/public stockholding	Public expenditure to finance the storage of agrifood products
	P. Marketing	Public expenditure to finance assistance in the marketing of agrifood products
	Q. Other (sector)	Other public expenditures related to the agrifood sector not classified in the categories above due to lack of information (as often the case of subnational expenditure) or the absence of appropriate category (e.g., expenditure on early warning systems, general forestry and land management, agri-processing, etc.)
	Administrative costs	Expenditures for the running costs of ministries not tied to a specific category, as well as policy formulation and policy coordination
Agricultural supportive expenditure		
	R. Rural education	Public expenditures on education in rural areas
	S. Rural health	Public expenditures on health services in rural areas
	T. Rural infrastructure	Public expenditures on rural infrastructure, such as rural roads (T1), rural water and sanitation facilities (T2), rural energy (T3), or others that cannot be classified in the previous categories
	U. Other support to the rural sector	Other public expenditures benefiting the agricultural sector that cannot be attributed to the above categories

Source: Authors' elaboration based on FAO 2015a.

6. **Classify projects/programs/expenditure items into sectors or commodities.** Depending on data quality, classification can also be done at the subsector level, e.g., crop, livestock, fisheries, and forestry, by products like rice, maize, and cattle, by funding source (donor vs. national), and by budget vs. actuals.

Sometimes, spending is already tagged across key economic, administrative, and functional categories in the raw data. For example, the raw database visible in Figure 2.6 (in BOOST format) already contains administrative, GFS, COFOG classifications, info on the funding source, and a project identifier that could be useful for building the classification key discussed in the next section. These are all elements that are extremely useful for the expenditure classification phase.

Figure 2.6: Example Structure of Public Expenditure Raw Data



VOTE I	SUBVOTE NUMB	2D NN C	4D GFS co	4D Item description	6D GFSCo	6D Item	PROJECT NUMB	FUNDDE	Broad Function	Sector
22	1001	Current	810400	Short-Term Domestic Loans	810404	Central Bar	0000	LOCAL	Governance - Economic Services	Other
22	1001	Current	810400	Short-Term Domestic Loans	810403	Central Bar	0000	LOCAL	Governance - Economic Services	Other
38	1001	Current	210100	Basic Salaries - Pensionable Posts	210102	Military Pa	0000	LOCAL	Defense and Security	Other
98	2005	Capital	270800	Current Grant To Non-Financial Public Units	270819	Road Fund	4170	LOCAL	Infrastructure	Roads
22	1001	Current	810500	Long-Term Domestic Loans	810502	Long-term M	0000	LOCAL	Governance - Economic Services	Other
22	1001	Current	250500	Interest Payments on Long-Term Debt to Othe	250502	Long-term M	0000	LOCAL	Governance - Economic Services	Other
46	1003	Capital	270900	Current Grants To Financial Public Units	270907	Higher Edu	4312	LOCAL	Social Services	Education
21	2001	Current	210100	Basic Salaries - Pensionable Posts	210107	Salary Adju	0000	LOCAL	Governance - Economic Services	Other
58	3001	Capital	270600	Current Grant To Non-Financial Public Units	270615	Rural Electr	3113	LOCAL	Production Services	Energy
21	2001	Current	290700	Contingencies Non-Emergency	290704	Domestic D	0000	LOCAL	Governance - Economic Services	Other
56	1009	Capital	270800	Current Grant To Non-Financial Public Units	270819	Road Fund	4170	LOCAL	Social Services	Roads
22	1001	Current	250100	Interest Payments to Foreign Non-Resident Ir	250105	Foreign Cor	0000	LOCAL	Governance - Economic Services	Other
22	1001	Current	210600	Employer Actual Contributions To Social Sch	210601	Public Serv	0000	LOCAL	Governance - Economic Services	Other
22	1001	Current	280500	Employer Social Benefits In Cash (Defined)	280502	Civil Servar	0000	LOCAL	Governance - Economic Services	Other

Source: FAO n.d

2.2.2. Data Classification

After compiling the required quantitative and qualitative data from the various sources, as mentioned in the previous section, the next step is to classify the data to allow a richer, more effective, and more informative analysis of the food and agricultural expenditure. There are three key aggregate classifications:

1. **Economic classification** of expenditure distinguishes between recurrent and development spending. Recurrent spending refers to short-term spending that is fully expensed in the fiscal period during which it is incurred; an example would be salaries or utility bills. Development spending refers to investments or spending on long-term assets that are amortized over their lifetime, like property or technology. This classification is often already embedded in the raw data (see Figure 2.6).

2. **Functional classifications** are the categories and subcategories described in Table 2.1; they might include transfers to producers or other agents, expenditure on agricultural research, infrastructure, marketing services, rural infrastructure, rural health, or rural education. This classification also identifies and quantifies administrative costs, i.e., expenditures not tied to any specific function.

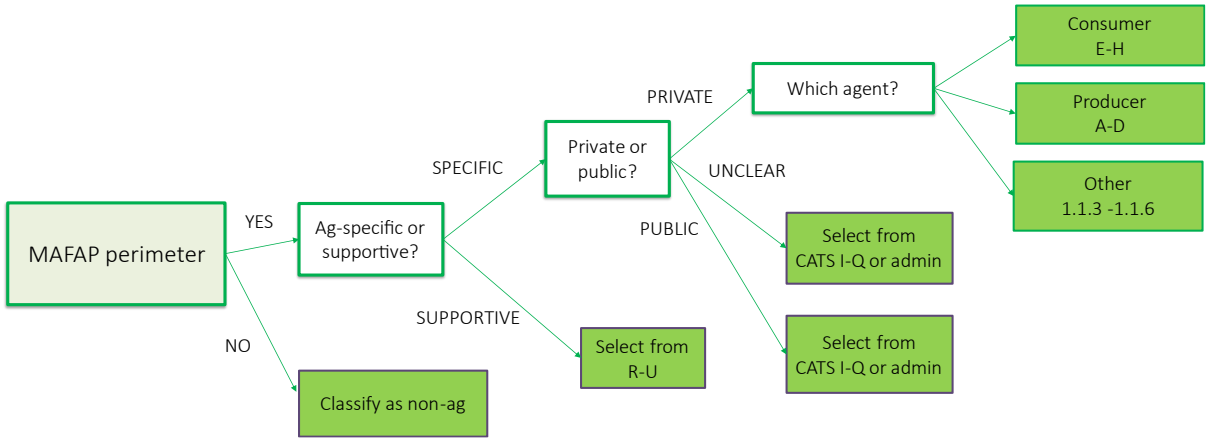
3. **Sectoral classification** allows the classifying of expenditure by subsector (crops, livestock, forestry, and fisheries) and by a group of commodities (cereals, cash crops, etc.) or specific commodity (maize, rice, sugar, cattle, etc.).

Functional Classification of Expenditure

It is good to follow a classification decision tree to apply the functional classification of the MAFAP methodology (see Figure 2.7). This helps to determine whether the expenditure line (or program/projects) falls into the agrifood perimeter, identify whether it provides a public or private service, and then assign the targeted agents or the sector as a whole.[23] These are often not available in raw quantitative data retrieved from public institutions, requiring qualitative data to be gathered from program documents or interviews.

[23] The MAFAP approach assumes that when there is uncertainty regarding whether an expenditure targets a public or private good, it is considered to target a public good. Note that this analysis does not consider potential spillovers of a project/expenditure, but focuses solely on the first-order effect or function. For example, spending on an irrigation system with potential health benefits is categorized as expenditure on irrigation, not as a rural health expenditure.

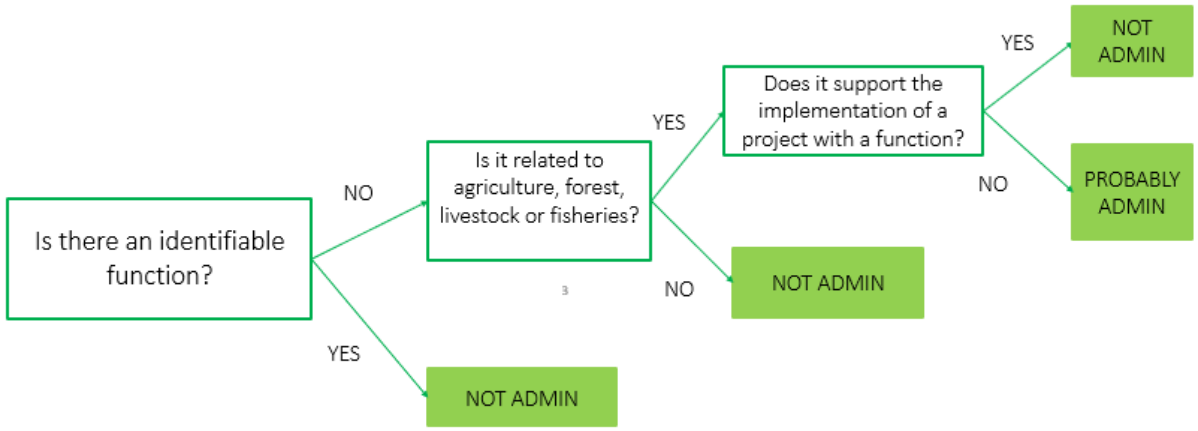
Figure 2.7: Classification Tree for Agrifood Public Expenditures



Source: FAO n.d.

Another crucial step involves identifying **administrative costs** for the agrifood sector (Figure 2.8). Not all expenditures with a function should be considered administrative costs under this functional classification. For instance, the maintenance of a Ministry of Agriculture's buildings, lacking a clear function, is considered an administrative cost. Human resources costs within the Ministry of Agriculture are categorized as administrative costs since they pertain to the agricultural sector but lack an identifiable function. In contrast, salaries of extension agents supporting a specific function are classified as an extension-related expenditure (category L).

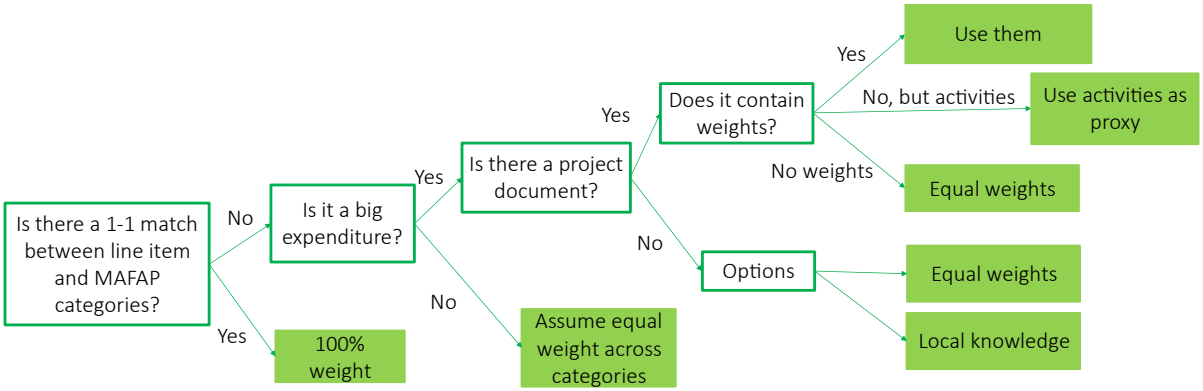
Figure 2.8: Classification Tree for Administrative Costs



Source: FAO n.d.

Big multipurpose projects and programs are also complex to classify (Figure 2.9). The underlying principle is first to identify whether the program has one function supporting another function or two (or more) separate functions. In the former case, the last purpose of the program should prevail: an expenditure for inspection infrastructure should be classified as inspection, not as infrastructure. In the latter, we will have to assign 'weights' for each function (e.g., a, b, c) by looking at detailed program activities or relying on local expert knowledge.

Figure 2.9: Classification Tree for Multipurpose Projects



Source: FAO n.d.

Table 2.2 shows an example of selected government programs with their respective planned and executed budget outlays. The first step is to identify whether they fall into the perimeter of analysis as defined by the MAFAP methodology. The decision trees above then help identify a functional category. It is useful to note the following:

- Programs or projects impacting the agricultural sector have been labeled 'ag-specific or ag-supportive, while non-agricultural projects have been labeled non-ag. Various public entities besides the Ministry of Agriculture execute these programs.
- The table displays the amount of resources planned at the beginning of the year for each program (budgeted) and the amount executed (actual). Additionally, and if the information is available, institutions or donors providing funds should be identified and listed for each entity and program, and their contribution to each program should be accounted for.
- The amounts allocated to current and capital spending are observed for each program. In this example, the expenses of the insurance premium subsidy program and the agrifood health program are entirely current. The subsidy program for sustainable forestry development includes both types of spending.
- Programs representing consumer support or other agents' support have been included. In this example, one is executed by the Ministry of Agriculture and the other by the Ministry of Education.

Table 2.2: Examples of Agriculture Programs' Functional Classification

Entity and Program		Budgeted			Actual			Perimeter	Category
		Current	Capital	Sum	Current	Capital	Sum	Non-ag, ag-specific, ag-supportive	
Presidency									
	Transparency and Civil Participation Program	-	146.2	146.2	-	146.2	146.2	Non-ag	-
	Agricultural Insurance Prime Subsidy	1,211.7	-	1,211.7	1,048.0	-	1,048.0	Ag-specific	B1 or Q*, based on the nature of the subsidy
Ministry of Agriculture									
	Rural education	4,282.8	-	4,282.8	4,305.0	2.2	4,307.2	Ag-supportive	R – Rural Education
	Milk consumption for rural communities	1,240.8	-	1,240.8	1,240.8	-	1,240.8	Ag-specific	E – Food Aid
	Agri-food Health and Safety	2,128.1	-	2,128.1	1,894.0	-	1,894.0	Ag-specific	M - Inspection
	National System of Agricultural Research	35.0	-	35.0	226.9	-	226.9	Ag-specific	I – Ag research
	Information System for Agricultural Prices	103.6	-	103.6	98.6	-	98.6	Ag-specific	P - Marketing
	Productivity Promotion Program	1,159.0	-	1,159.0	1,301.1	-	1,301.1	Ag-specific	See the example in Table 2.3
Ministry of Communications									
	Rural Road Construction Project	-	-	-	-	1,244.5	1,244.5	Ag-supportive	T1 – Rural Roads
Ministry of Health									
	Construction of rural hospitals	-	5,834.0	5,834.0	-	4,205.4	4,205.4	Ag-supportive	S – Rural health
Public Education									
	National School Breakfast Program	231.3	-	231.3	209.5	-	209.5	Ag-specific	G – School Feeding
	Urban Schools Management Program	6,879.0	-	6,879.0	6,879.0	-	6,879.0	Non-ag	-
Ministry of Agrarian Development									
	Modernization of rural cadastre	140.1	-	140.1	111.1	-	111.1	Ag-supportive	U – Other support to the rural sector
Ministry of Environment									
	Subsidies for sustainable forest development	151.0	1,003.5	1,154.5	104.4	1,359.1	1,463.4	Ag-specific	B1 – Input subsidies

*if no more specific info is available

Table 2.3 presents an example of components of a hypothetical program relevant to the agricultural sector and financed with budgetary resources from the table above. The program is categorized based on its components, and the related activities and the number of beneficiaries determine the weights for each component. This is because there is no available information on how the budget is allocated for each component. Beneficiaries of Component 1 are the same for all activities in the component, representing half of all the program's beneficiaries. Since no further information is provided at the activity level, the weights for each initial component activity are assumed to be equal.

Table 2.3: Classification of the Productivity Promotion Program

Component	Activities	Number of Beneficiaries	Weight Assigned	Classification
1. Adoption of new seed varieties in zone A	Delivery of subsidized seeds and fertilizer	3,000	16.66%	B1
	Provision of soil plowing services	3,000	16.66%	B3
	Delivery of training through farmer field schools	3,000	16.66%	K
2. Infrastructure for post-harvest in zone B	Construction of post-harvest infrastructure	2,000	33.3%	N3
3. Rural marketing in zone C	Support to marketing of agricultural products	1,000	16.66%	P
Total		**6,000**	**100%**	

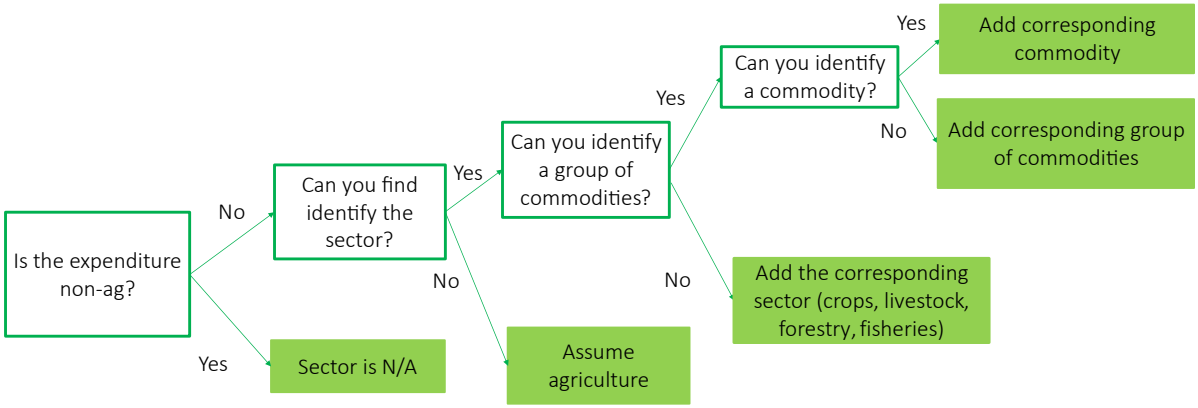
Sectoral Classification of Expenditure

An additional layer of analysis is classifying expenditure by subsector (crops, livestock, forestry, and fisheries) and by group of commodities (cereals, cash crops, etc.) or specific commodity (maize, rice, sugar, cattle, etc.).

This sectoral or commodity classification is particularly important, as these data feed into the computation of price incentives indicators as treated in the following Module 3. since the producer-specific budget transfers toward a single commodity (category A to D in Table 2.1) enters into the calculation of the nominal rate of protection. This indicator estimates the support provided to producers of specific commodities (or groups of commodities if aggregated) through trade and market measures that support (or depress) domestic prices and subsidies to production.

We can follow the decision tree in Figure 2.10 to assign sector, subsector, and commodity categories. Some programs have enough information on their targeted products, or for which it is possible to find documentation or ask local experts. However, often, identifying the allocations by product could be quite challenging. In this case, it is necessary to resort to assumptions that allow an approximation of the transfers of that program (or expenditure line) to each of the products. Among the options, we could assume equal weights across the various products or apportion the expenditure by the contribution share of each product to the total value of agricultural production, for example. Specific knowledge of agricultural subsidy programs in the country is often fundamental to defining a good apportionment of expenditure by commodity or subsector, for which interviews with national experts could prove useful.

Figure 2.10: Decision Tree for Sectoral Classification



Source: FAO n.d.

Table 2.4 shows a practical example of how to estimate spending by commodity for a production subsidy program that targets several products. First, the share of each analyzed crop in the aggregate production value for the commodities targeted is calculated as shown in (1). The total executed amount of the program is shown in (2). The spending amount allocated to each commodity is thus (1) *(2).

Table 2.4: Example of Approximating Spending on Each Commodity

Product	Share In Aggregate Value of Production (%)	Total Amount Production Subsidy Program ($)	Program Allocation To Product (US$) (Year 1)
	(1)	(2)	(1) * (2)
Rice	30	1,220	366
Milk	20		244
Potatoes	15		183
Maize	15		183
Beef	10		122
Eggs	5		61
Total, allocated	**95**		**1,159**
Others, unallocated	**5**		**61**

The above table presents spending by one program on multiple commodities. On the other hand, constructing a table with the total spending from all projects or programs for each commodity will also be useful, especially for calculating the NRA indicator, which is explained in more detail in Module 3. Table 2.5 presents estimates of total spending for maize. This includes aggregating support provided through all programs targeting maize, classified according to the MAFAP classification criteria.

Table 2.5: Example Spending for Maize (Year 1)

Category	Formula	Amount (LCU)
I. Production subsidies	(I.1) +(I.2)	30.0
Program 1		10.0
Program 2		20.0
II. Input subsidies	(II.1) +(II.2)	233.0
1. Fertilizer for maize program		50.0
2. Interest Rate Program		183.0
III. Income support	(III.1) +(III.2)	150.0
1. Direct income transfer for agricultural producers		150.0
2. Program 2		0.0
IV. Other support		0.0
TOTAL	***(I+II+III+IV)***	**413.0**

MODULE 3: PRICE INCENTIVES FOR AGRICULTURAL COMMODITIES

As shown earlier, governments have various instruments with which they may influence the agrifood system (Figure I.1). In Module 2, we discussed a range of budgetary measures that governments utilize. In addition to these mechanisms, governments also intervene in markets through trade and market policies that affect domestic prices and, therefore, incentives for food producers and consumers. The analysis of agricultural policy support would be incomplete without accounting for these interventions. Often, these interventions do not involve a budgetary outlay or explicit transfer by the public sector to the agrifood sector. Nevertheless, they still represent a 'cost' for some segments of society, such as consumers.

Objectives of price incentive policies include protecting domestic producers from import competition, stabilizing and increasing their incomes or controlling food prices for consumers, promoting food security, boosting trade and export revenues, and responding to political pressure. Most of these policy interventions do not require an allocation of public funds. However, they are extremely important for repurposing strategies, as they are often the most distorting and harmful interventions governments adopt to support (or otherwise) farmers and the sector. Moreover, a misalignment between price incentives and fiscal support can reduce or even eliminate the efficacy of farm subsidies or budgetary support to the sector as a whole.

This module provides theoretical guidelines for price incentive analysis based on internationally-recognized methodologies. As highlighted earlier, the methodology introduced in this section follows MAFAP as it offers the possibility of computing some additional indicators of price distortions that could complement the price incentives policy analysis, especially for low-income countries.

3.1. KEY PRICE INCENTIVE INDICATORS: DEFINITIONS, CALCULATION, AND INTERPRETATION

Using price incentive indicators, we can evaluate how policies impact domestic prices and influence various value chain participants, including producers, traders, and consumers. This analysis helps uncover the reasons behind the disparities between domestic prices and the hypothetical non-distorted prices known as the reference price. The reference price is the border price of a product adjusted for market costs, quality, and quantity factors, representing the 'undistorted' commodity price unaffected by policies and market distortions. Thus, the difference between the reference and domestic prices at a specific point in the value chain indicates the degree of price distortions resulting from policies, market dynamics, and imperfections.

Key indicators at the commodity level include the price gap (PG), nominal rate of protection (NRP), and nominal rate of assistance (NRA).[24] These commodity-level indicators can then be used to develop sector-level indicators such as the average NRP or NRA. Similarly, PG can be used to calculate the total support to the sector through price incentives or disincentives.

The **PG** represents the absolute difference between a commodity's domestic and reference prices, calculated at the farm gate, wholesale, and retail levels of the commodity's value chain. PG expresses by how much the domestic price is above (positive gap) or below the reference price (negative gap). A positive PG indicates price incentives (benefiting farmers or traders), while a negative PG indicates disincentives (harming farmers or traders) at the farm gate, wholesale, or retail level. The PG can be

[24] NRA is the sum of NRP and budgetary transfers estimated under through PEA.

used to calculate the total value of price incentives by multiplying the PG with domestic production volume.

The **NRP** measures the percentage by which the domestic price is above (if positive) or below (if negative) its reference price at the farm gate, wholesale, or retail market.[25] Therefore, a positive NRP indicates that the policy environment and value chain market dynamics push prices above the reference, thus providing price incentives to produce. A negative NRP signals that producers or traders are facing price disincentives, thus receiving less than what would be possible in a scenario free of interventions. A zero NRP suggests that the protection structure is neutral, which could also mean that the effects of policies and market integration factors are canceled. While the PG is an absolute value measured in currency units, the NRP, as it is a percentage, allows for comparison between commodities and countries and enables its interpretation as a share of the reference price.

The **NRA** measures the net effect of trade and market policies captured by the NRP and public expenditure (also said budget transfers) targeting the producers of a specific commodity. These transfers include input subsidies (on variable inputs, capital, or on-farm services), income support, and output subsidies. This indicator provides a more complete measure of (dis)incentives created by policies and expenditures.

The **MDG** quantifies price disincentives stemming from value chain inefficiencies. It is an aggregate estimate of the effect of excessive market access costs on the producer price. "Excessive" costs may result from factors such as poor infrastructure, high processing costs due to obsolete technology, government taxes and fees (excluding fees for services), high profit margins captured by various marketing agents, illegal bribes, and other informal costs. All of these can impede the transmission of world prices to domestic markets and generate a price penalization for farmers. As such, the MDG does not capture trade and market policy effects but rather the lack of policy, which causes markets to be underdeveloped.

3.1.1. Data Needs for Price Incentive Analysis

The first key step is selecting the commodities for the analysis (see Section 3.2 for detailed steps). Once the commodities are identified, we need to collect qualitative and quantitative data.

Qualitative data refers to info on the value chain context, identification of the trade patterns and the policy measures affecting the commodity analyzed. Reviewing the value chain functioning allows the identification and understanding of the representative market pathway for the commodity, which includes agents and a range of activities involved from production to final international and national market destinations. This requires a comprehensive look at where the commodity is grown and harvested, its movement toward the market—through intermediaries including producers' organizations, processors, transporters, wholesalers, and retailers—and to the final consumers and border. Information on the policies affecting the product is key to interpreting the price incentive indicator trends.

Quantitative data needed to compute price incentive indicators include three main types of data:

- Prices, including border (import or export) prices and domestic prices at different points of the value chain, i.e., farm gate, and wholesale and retail if the analysis is to be undertaken at those levels;

[25] The wholesale market is defined as point of competition, where the national production competes with the imported product.

- Market access costs, including transport costs, handling and processing costs, taxes, and other fees for the various segments of the value chain;
- Volumes and values of production, consumption, and trade;
- Quantity and quality adjustment factors, if the product analyzed at the different levels of the value chain differ, e.g., milled rice at the border and paddy rice at the farm gate, to compare like with like.

Table 3.1 provides an overview of the data needed and potential sources.

Table 3.1: Data Needs and Most Common Data Sources for Calculating Price Incentive Indicators

	Farm Gate Prices	Wholesale/Retail Prices	Border Prices (CIF/FOB)	Market Access Costs	Conversion Factors
Data needed	*Price at farm gate level or point in the value chain closest to the farm gate*	• *Wholesale prices in the main wholesale market* • *Average retail prices in main consumption areas*	• *Traded quantities* • *Border prices* • *Exchange rate*	• *Transport costs* • *Processing costs* • *Handling and storage costs* • *Fees and other costs (bribes, etc.)*	• *Quantity conversion factors* • *Quality conversion factors*
Potential source (in order of preference)					
National institutions	• National statistical offices and/or statistical branches in ministries • Ministries of agriculture, economy and finance, trade • Central banks • Regulatory bodies/commodity boards/sectoral institutions • National research centers • Producer or consumer associations			• Ministry of Agriculture • Regulatory bodies/commodity boards/sectoral institutions • National research centers • Ministry of Agriculture • Regulatory bodies/commodity boards/sectoral institutions • National research centers	
Existing databases Surveys	• FAOSTAT, GIEWS (WS/RT) • WFP-VAM (WS/RT), World Bank, FEWSNET, and others • Household budget surveys/agricultural surveys		• UN COMTRADE • CEPII-BACI • FAOSTAT	• Value chain studies • Household budget surveys/agricultural surveys	• Value chain studies
Primary data collection	• Interviews with key informants • (Small) field surveys			• Interviews with key informants • (Small) field surveys	• Interviews with key informants

Notes: CIF = cost, insurance, and freight. FOB = free on board.

3.1.2. Calculating Price Incentive Indicators

The steps to compute the key price incentive indicators for the commodities selected for the analyses, according to the MAFAP methodology, are outlined below.

a) Calculating the Reference Price

The first step to compute the indicators is to calculate the reference price, since PI indicators aim to compare the domestic price of a given commodity at a specific level in the value chain with its reference price. This hypothetical price would prevail in the market if there were no policies or market dynamics influencing prices. The reference price is computed at the border, the point of competition (PoC),[26] the farm gate, and the retail level.

The reference price is calculated from a benchmark price (border) price converted into local currency using the exchange rate and then adjusted by market access costs and quality and quantity differentials to make it fully comparable with the actual domestic price at the different points along the value chain.

Computing the benchmark price is different for imported and exported commodities.[27] This is why it is critical to assess the trade status of the commodities. In most cases, for imported commodities, the benchmark price is the annual average cost, insurance, and freight (CIF) paid by importers; for exported commodities, the benchmark price is the free on board (FOB) price received by exporters. If reliable data are available, the CIF or FOB prices can be obtained by dividing the value of imports (or exports) by their volume.

$$CIF(or\ FOB)price = \frac{Value\ of\ imports\ (or\ exports)}{Volume\ of\ imports\ (or\ exports)}$$

Once we have the benchmark (border) price, we need the following:

a) Market access costs for all legs of the value chain (farm gate to PoC, border, and retail if analyzed) that include transportation, taxes, informal costs, and profit margins for buyers and traders;

b) Quantity or quality conversion factors to ensure that the commodity at different levels of the value chain is comparable in terms of quality and quantity. A quantity conversion factor is needed when a commodity traded at one point in its value chain differs in quantity or volume at another point of its value chain. This is due to processing or any physical transformation, e.g., sugar cane vs. sugar, tea leaves vs. tea, paddy rice vs. milled rice. On the other hand, a quality conversion factor is required when there is a relevant difference in quality between imported and domestically produced products, e.g., imported 10 percent broken rice vs. 5 percent broken local rice, bananas for domestic consumption vs. bananas for export markets.

The first point in the value chain where we will compare the reference price to domestic prices is the PoC. For this, the analyst must consider the quantity and quality conversion factors and access costs between the border and the PoC, which is usually the main wholesale market (WH).

- If the commodity is imported to the country, access costs from the border to the PoC should be added to the reference price at the border to account for the full cost of imports.

[26] The point of competition (PoC) refers to the main wholesale market, which is the first point in the value chain where we compare the reference price with the domestic price.

[27] With commodities that are thinly traded, we can make some assumptions to extrapolate a reference price. For example, we can use the price of the product in a market close to the border where the product is exchanged or the price for a substitute commodity.

- If the commodity is exported, access costs are deducted from the reference price at the border to consider the additional costs needed to compete in international markets and make export prices equivalent to prices at the PoC.

Thus, the reference price at the point of wholesale can be determined by using the following equations:

$$RP_{wh} = \left(P_{b(loc)} \times QT_{wh} \times QL_{wh} \right) + AC_{wh} \text{ [}\textit{if the commodity is imported}\text{]}$$

$$RP_{wh} = \left(P_{b(loc)} \times QT_{wh} \times QL_{wh} \right) - AC_{wh} \text{ [}\textit{if the commodity is exported}\text{]}$$

Where AC is the market access cost, and QT and QL are quantity and quality conversion factors.

Thus, the observed reference price at retail (RP_{rt}) is determined by the following equation:

$$RP_{rt} = (RP_{wh} \times QT_{rt} \times QL_{rt}) - AC_{rt}$$

Thus, the reference price at the farm gate is determined by the following equation:

$$RP_{fg} = \left(RP_{wh} \times QT_{fg} \times QL_{fg}\right) - AC_{fg}$$

The reference prices are key information required to obtain the PG, NRP, and NRA indicators.

b) Calculating the PG

The PG can be measured for three different points in the value chain. It is the difference between the reference price (RP) and the domestic price (P) at I, which is the relevant point in the value chain (wholesale, retail, or farm gate).

$PG_i = P_i - RP_i$ i = wholesale, retail, or farm gate

c) Calculating the NRP

The NRP is obtained by dividing the PG by the RP, all in local currency. This will give a ratio that can be compared across commodities, years, and countries.

$NRP_i = \frac{PG_i}{RP_i}$ i = wholesale, retail, or farm gate

d) Calculating the NRA

The NRA is computed only at the farm gate, as the sum of the PG and budgetary or other transfers, dividing the result by the RP.

$$NRA_{fg} = \frac{\left(PG_{fg}\right) + BOT}{RP_{fg}} \times 100$$

Box 3.1 provides a case study on calculating the RP, PG, and NRP, while section 3.2 provides detailed calculation information.

Box 3.1: Case Study: Calculating the RP, PG, and NRP for Rice in Burkina Faso

To calculate PI indicators for rice in Burkina Faso, we need to compute the reference price. Burkina Faso is net rice importing country, exports are almost non-existent because all production is consumed domestically and does not meet internal demand. Thailand is the primary source of imported rice, which enters the country through the port of Téma in Ghana.

The CIF price from the first custom post in Burkina Faso (Dakolo, Burkina-Ghana border) is taken as the benchmark price, and it already includes the costs to the port. CIF is calculated as value over quantity of imports of Thai husked rice, using data from the National Foreign Trade Bureau and the National Demographics and Statistics Institute as shown in Table 3.2. This data is taken from MAFAP archives.

Table 3.2: CIF Price in Dakola for Rice Imported from Thailand

	2013	2014	2015	2016
Import value (FCFA)	13 385 514,149	9 146 153 792	3 062 997 596	63 651 184 153
Import quantity (kg)	102 438 018	69 985 292	23 640 552	485 166 221
CIF (FCFA/Tonne)	**130 669**	**130 687**	**129 565**	**131 195**

After obtaining the border price, the second step to building the RP is to obtain access costs. Access costs cover all actual marketing costs and margins observed in the market pathway. In this case study, they include transportation, storage, taxes, informal costs such as bribes at roadblocks and profit margins for buyers and traders. Access costs are obtained from the border to PoC, the farm gate to PoC and from PoC to the retail market.

The third step toward building the RP is identifying the need for conversion factors to ensure that the commodity at different levels of the value chain is comparable in quality and quantity. The benchmark price in Burkina Faso is for the Thai husked rice imported into the country, while the domestic rice price at the farm gate refers to paddy rice. To compare the benchmark price of husked rice with the domestic price of paddy rice at the farm gate level, we need to use quantity conversion factors that help us to mathematically transform the paddy rice into husked rice.

Based on the value chain context analysis, we know that the transformation of 1kg of paddy rice yields an average of 0.67kg of husked rice in Burkina Faso. We also know that the rice produced in the Bagré region and analyzed at the farm gate has a different quality than the imported rice, and consumers largely prefer the imported one, pushing up its price. It is, therefore, necessary to use a quality adjustment factor, which is the ratio between the price of the imported rice and the price of the local rice in the same wholesale market (Ouagadougou). The ratio is on average 1.03 (the average imported rice price of 18,000 FCFA divided by the average local rice price of 17,500 FCFA).

By adjusting the benchmark price by conversion factors and by the market access costs, we can compute, from the benchmark (border) price, the RP at different levels of the value chain (Table 3.3).

Table 3.3: Reference prices for rice in Burkina Faso in 2013-2016

	2013	2014	2015	2016
Border price	130 669	130 687	138 100	131 195
Access costs from Border to POC				
Transport costs	8 824	8 799	8 878	9 004
Margins	38 667	36 167	35 417	35 000
Transformation				
Handling	1 000	1 000	1 000	1 000
Taxes and fees	24 090	26 225	26 225	26 225
Other costs	2 067	2 126	2 199	2 214
Reference price at the point of competition	205 316	205 004	211 819	204 638
Quantity conversion factor (from paddy to husked rice)	.620	.620	.620	.620
Quality conversion factor (imported vs local rice)	1.030	1.030	1.030	1.030
Access costs from Farm Gate to POC				
Transport costs	12 152	12 000	12 000	12 000
Margins	15 000	13 797	15 335	15 000
Handling	1 000	750	750	750
Taxes and fees	6 000	8 875	8 875	8 901
Other costs	178	178	178	178
Reference price at the farm gate	96 784	95 315	98 129	93 852

From the data in Table 3.3, we can easily compute the PG and, consequently the NRP, as follows:

PG at PoC (Ouagadougou) $PG_{wh} = P_{wh–} - RP_{wh}$

PG at farm gate (Bagré) $PG_{fg} = P_{fg} - RP_{fg}$

NRP at PoC in Ouagadougou = $NRP_{wh} = (PG_{wh} / RP_{wh}) * 100$

NRP at farm gate in Bagré = $NRP_{fg} = (PG_{fg} / RP_{fg}) * 100$

Hence, Table 3.4 shows the resulting PG and NRP for the example.

Table 3.4: Price Gaps and Nominal Rates of Protection for rice in Burkina Faso in 2013–2016

	2013	2014	2015	2016
Reference price at the point of competition	205 316	205 004	211 819	204 638
Domestic price at the point of competition	386 667	361 667	354 167	350 000
Price Gap at the point of competition	181 350	156 663	142 348	145 362
Nominal Rate of Protection at the POC	**88%**	**76%**	**67%**	**71%**
Reference price at the farm gate	96 784	95 315	98 129	93 852
Domestic price at the farm gate	150 000	137 972	153 347	150 000
Price Gap at the farm gate	53 216	42 657	55 217	56 148
Nominal Rate of Protection at the farm gate	**55%**	**45%**	**56%**	**60%**

A positive NRP at the point of competition (PoC) and the farm gate indicates that wholesalers and producers of rice obtained prices higher than their international equivalents (reference prices).

Implicitly, this could imply a negative effect on consumers who are likely to buy rice at a higher price.

Source: MAFAP 2017

e) Calculating the MDG

The movement of commodities from the farm gate to markets involves market access costs such as transport, processing, handling and storage costs, taxes, fees, and traders' margins. However, these costs are sometimes excessive due to value chain inefficiencies arising from poor infrastructure, monopolistic market structures, and asymmetric market information. All of these can impede the transmission of world prices to domestic markets.

To 'simulate' a potential situation of improved efficiency and reduced costs, the actual (or observed) market access costs are adjusted downward to the level of an efficient market. This can be done using the following assumptions: omission of all transfers/taxes and fees not corresponding to a service, such as informal marketing costs, bribes, or local taxes; reduction of access costs of processing, handling, and transport, if they are deemed too high or result from suboptimal functioning of the value chain; reduction of agents' margins to a fairer level if these are excessive. To determine a more 'reasonable' level for these costs, we often benchmark countries with a more developed or better-integrated value chain or where infrastructure and logistic services function better. As such, those better-developed countries' processing and marketing costs are lower.

Once access costs are 'artificially lowered' to reflect more efficient value chain dynamics, we can calculate the Access Costs Gap at wholesale (ACG_{wh}) and the farm gate (ACG_{fg}). These gaps are simply the difference between the adjusted and the observed/actual costs. Both are used to compute the MDG. They might have opposite effects on farmer incentives according to the trade status of the commodity, since for an imported product, excessive access costs from the border to the PoC act as an obstacle to importers and make the imported goods more expensive than the domestic ones, representing a benefit to farmers, in principle.

The MDG is the total access costs gap (ACG), including the cost gap at the farm gate level (ACG_{fg}) and the PoC/wholesale level (ACG_{wh}). It is usually expressed in relative terms as a share of the farm gate price (Pf_g) to allow for comparison between years, countries, and commodities.

To calculate the MDG, we first need to calculate the access cost gaps. The access cost gap is defined as the difference between the observed and adjusted access costs and can be estimated for two segments: between the border and the PoC, and between the PoC and the farm gate. The access cost gap is negative by definition, as the adjusted costs are lower than the observed ones.

Access cost gap to the point of competition [ACG_{wh}] = $aCo_{wh} - aCa_{wh}$

Access cost gap to farm gate [ACG_{fg}] = $aCo_{fg} - aCa_{fg}$

The MDG is an absolute measure, which is also expressed in relative terms to allow for comparison between years, commodities, and countries by calculating the ratio of the total MDG at the farm gate (MDG_{fg}) to the domestic price at the farm gate (P_{fg}) as follows:

$$MDG_{\%} = \frac{MDG_{fg}}{P_{fg}} = \frac{(ACG_{wh} + ACG_{fg})}{P_{fg}}$$

where ACG_{wh} is the access cost gap at the PoC, defined as the difference between observed and adjusted access costs at the PoC, and ACG_{fg} is the access cost gap at the farm gate, defined as the difference between observed and adjusted access costs at the farm gate.

f) Aggregated PI Indicators at the Country Level

Aggregate PI indicators can be calculated across commodities in a given country. An NRP or NRA indicator for the whole agricultural sector of a given country includes all single commodities analyzed, which should, in principle, cover at least 70 percent of the total value of agricultural production to be considered representative (MAFAP, 2015a). The higher the coverage share, the more reliable the aggregate measure of (dis)incentives for the full sector.

The formula for constructing aggregate indicator is as follows:

$$NRP_A = \frac{\sum_{i=1}^{i=n} NRP_i * PROD_i * RP_{fgi}}{\sum_{i=1}^{i=n} PROD_i * RP_{fgi}}$$

Where, NRP_A is the aggregate NRP for n commodities, NRP_i is the NRP for the commodity *i*, $PROD_i$ is the volume of production in tonnes (or any other unit) of the commodity and RP_{fgi} is the RP of the commodity at the farm gate.

The same applies in the case of aggregate NRA and MDG:

$$NRA_A = \frac{\sum_{i=1}^{i=n} NRA_i * PROD_i * RP_{fgi}}{\sum_{i=1}^{i=n} PROD_i * RP_{fgi}};\ MDG_g = \frac{\sum_{i=1}^{i=n} MDG_i * PROD_i * RP_{fgi}}{\sum_{i=1}^{i=n} PROD_i * RP_{fgi}},$$

where NRA_i and MDG_i are the NRA and MDG for commodity *i.*

3.1.3. Interpreting Price Incentive Indicators

PI indicator levels and trends are analyzed to understand whether producers and traders are incentivized or discouraged from engaging in a particular value chain or market. Before detailing the interpretation of each indicator, it is important to highlight the main policies influencing prices and PIs. These include policies designed to achieve a certain goal and the absence of policies intended to correct market failures.

PI analysis focuses on policies that directly or indirectly affect the domestic prices of agricultural commodities. The most common policies affecting agricultural prices are import tariffs and quotas, export duties and bans, exchange rate policies, price fixation, input subsidies, and food aid for poor consumers. Governments frequently do not act to correct market failures and inefficiencies. Such market failures include monopolistic behavior, bribes and informal fees, high transport costs, and excessive processing/handling costs. Each type of market failure impacts domestic prices. Details on how these policies can affect commodity prices will be discussed in the next subsections.

It is also important to highlight some **challenges or limitations** the price incentive analysis faces. In particular, such analysis becomes less meaningful and powerful when looking at thinly traded commodities since data on the RP will not be accurate enough or hard to find. As with any other economic analysis, data quality, limitations, and assumptions should be carefully considered when reading the findings and proposing policy recommendations. For example, calculating the NRP and NRA depends on data that capture a very specific market pathway for the examined commodity. This pathway may not entirely reflect the broader situation in the country. Also, when using year-average

prices, the analysis neglects important seasonality aspects affecting prices and farmer incentives. Another challenge lies in the availability of access cost data, especially on margins for different actors along the value chain. For these reasons, such analysis should not be prescriptive, given the data and methodological constraints. In some cases, it is also hard to identify the multiple factors driving the NRP/NRA trends and define clear-cut policy messages or recommendations from the analysis. The price incentives methodology offers an initial assessment of policy distortions and requires further scrutiny before proposing policy reform or repurposing options. Finally, the price incentives analysis can measure incentives/disincentives at three points in the value chain: farm gate (farmers), wholesale (wholesalers or traders) and retail (and by inverse proxy, to consumers), but it is not able to disaggregate the level of incentives to other actors in the value chain such as processors or other intermediaries.[28]

NRP Analysis and Interpretation

A negative NRP indicates price disincentives, implying that farmers or traders receive prices less than would be possible without policy intervention and with efficient markets. A positive NRP indicates PIs, implying that farmers or traders receive a higher price than would be possible without policy intervention or market distortions. An NRP value of zero indicates that farmers or traders are neutral, receiving no incentives or disincentives.

The most common policies and market factors that could explain changes in the PG and NRP are trade policies, domestic market policies, international prices and exchange rate fluctuations, and demand and supply dynamics that affect domestic prices.

Trade policies include import tariffs and quotas, export duties, bans, and other non-tariff measures such as sanitary and phytosanitary regulations, testing, and certification. Import tariffs and quotas will likely result in positive NRP (price incentives), as they protect farmers from competition from imported commodities, increasing domestic prices. Export tariffs are likely to negatively affect domestic prices and the NRP, as they reduce the amount that farmers can be paid to remain competitive in the world market. Similarly, an export ban would likely decrease the NRP, as it reduces the total demand for the commodity.

Market policies, such as price-setting or minimum farm price policies, will affect the NRP depending on the formula and how it reacts to international prices and exchange rates. The analysis of the NRP is a powerful instrument to detect whether a price-setting policy is bearing the expected effects (see Box 3.2 on the case of cotton in Mozambique). Input subsidies on fertilizers and seeds, among others, could also, in theory, negatively affect the NRP, even if not accounted for in the computation of the NRP. This is because they lower production costs and allow farmers to sell output at a lower price. Where large input subsidy programs are in place, it might be 'acceptable' to see negative NRPs even without other explicit policies depressing prices.

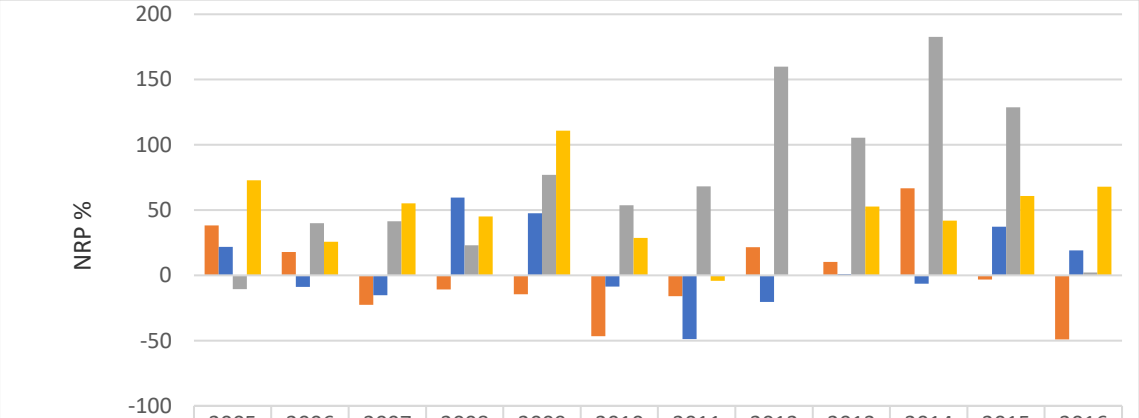
Consumer subsidies on food for the population may also affect and lower the domestic price and result in a negative NRP at the retail or wholesale level. However, these effects are unclear at the farm gate level and must be assessed case-by-case. On the contrary, cash transfers may support purchasing power and food demand and increase domestic prices, hence, the NRP.

[28] Alonso and Swinnen (2016) propose a methodology to disentangle the impact for various actors and apply it in the wheat sector in Pakistan.

Box 3.2: Price Incentive Indicators to Inform Country-Level Policy Change: Cotton in Mozambique

Cotton is an important source of revenue in Mozambique. However, over the 2005–2018 period, the decline in international cotton prices, an unstable exchange rate, and a producer price-setting formula that did not adequately address volatile macroeconomic conditions led to penalizing cotton farmers in Mozambique compared to other Sub-Saharan African countries. As indicated by the NRP in Figure 3.1, Mozambican farmers fetched prices lower than the RP despite the government's price-setting policy to ensure fair prices.

Figure 3.1: NRP for Cotton at the Farm Gate in Selected East and Southern African Countries



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Mozambique	38	18	-23	-11	-14	-47	-16	21	10	67	-3	-49
Malawi	22	-9	-15	60	47	-9	-49	-20	1	-6	37	19
Tanzania	-11	40	41	23	77	54	68	160	105	183	129	2
Uganda	73	26	55	45	111	29	-4		53	42	61	68

Source: MAFAP database 2017.

This prompted the Government of Mozambique to assess its policy options to stabilize and foster the cotton sector. For this, a detailed analysis of cotton trade flows, international specialization, trade policy and price incentives was undertaken to identify best practices and explore reform options for Mozambique's cotton value chain.

The recommendations arising from the analysis included using future rather than spot prices when setting the cotton price for the season, periodically-reviewed price bands, and a US$-based price-setting mechanism to ensure that producers receive a constant share of the international prices. Of these recommendations, the Government of Mozambique adopted the change of the pricing formula, using future rather than spot prices. A periodical review of price bands was also implemented, and a smoothing and development fund was designed.

International prices and exchange rate fluctuations can affect NRP, such as in the case of imperfect price transmission in which domestic prices do not adjust or are delayed in reacting to changes in the international price. For instance, bad harvests in large producer countries may increase the commodity's international price, while good harvests may have the opposite effect. If these price changes are not well transmitted to domestic markets, the PG may decrease or increase, meaning NRP

will face a similar trend. Also, shifts in consumption patterns in big consumer countries can affect international price patterns. Similarly, domestic prices may not adjust perfectly to reflect changes in the exchange rate. When domestic prices decrease at a lower rate than the currency's depreciation, this will negatively affect the NRP. Conversely, when domestic prices decrease more slowly than a currency appreciates, this will lead to larger price gaps and an increased NRP.

Changes in demand or supply at the domestic level can affect domestic prices and, hence, the NRP. Typically, an increase in local supply will impact prices negatively and generate lower or negative NRP. Conversely, a sudden shortfall in production will increase prices and likely drive up NRP. Changes in supply are usually related to weather events or other shocks, such as conflicts that can affect harvests or disrupt marketing channels. If the supply does not adjust instantaneously to maintain the price constant, a sudden increase in local demand will likely lead to a higher NRP, and the opposite holds for a decrease in demand.

Value chain features mainly refer to market inefficiencies that can affect domestic prices if they are not captured properly in the access costs estimation. Market inefficiencies include various factors, including information imbalance. Traders may know more about the international market and can capitalize on this by buying crops at low prices from farmers and selling them for higher market prices. Uncompetitive behavior, where a buyer or group of buyers influences prices, can also lead to market inefficiencies. The seasonality of agriculture is also a factor; farmers may have excess supply during the harvest season, exacerbated by poor storage facilities. As a result, farmers are often compelled to sell at lower prices and face disincentives. Traders often benefit from arbitrage opportunities by buying when prices are low and selling when prices are high. Note that prices tend to increase during the season before the next harvest.

NRA Analysis and Interpretation

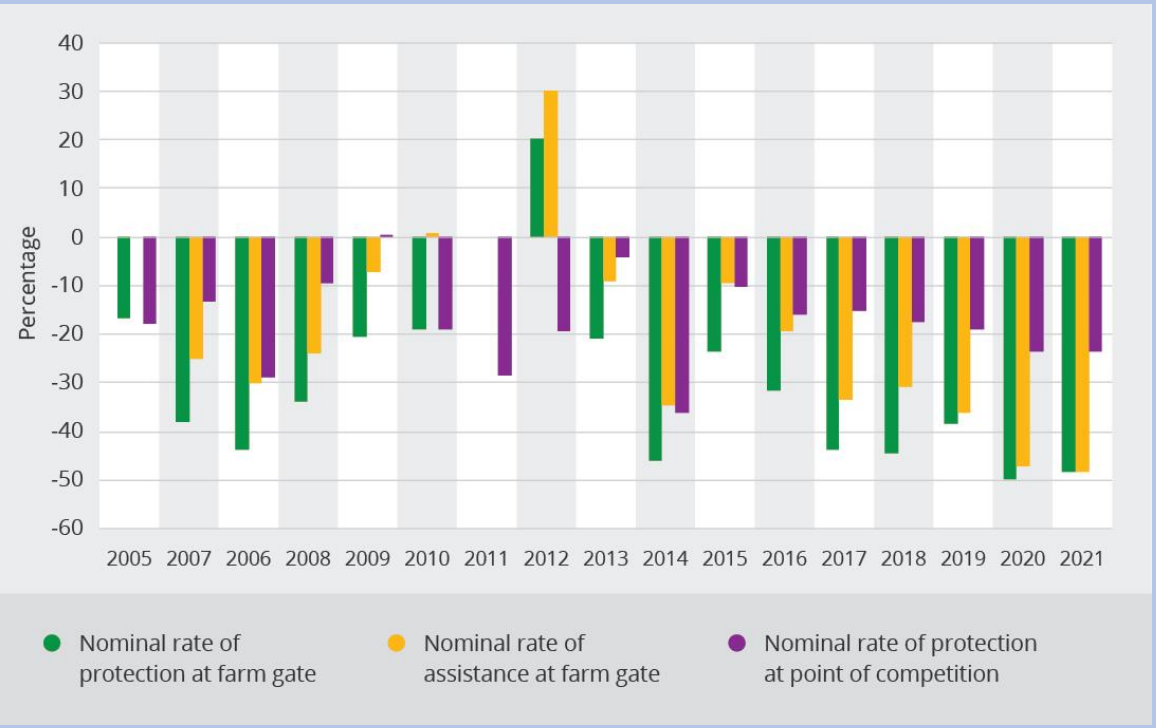
The interpretation of NRA is similar to that of NRP. However, by combining price and budget supports, the NRA provides a more accurate picture of incentives, particularly in cases where subsidies may compensate for price disincentives to producers generated by trade and market policies. A positive NRA at the farm gate signals that commodity producers are subsidized overall. A negative NRA implies that producers are facing taxation rather than subsidization. If both the NRP and NRA are negative, this indicates that budgetary support cannot compensate for the potential taxation that farmers face on the price side. In contrast, if the NRP is negative and the NRA is zero or positive, it means that producers' subsidies compensate for the relatively low farm gate prices. Box 3.3 features an example of NRA analysis.

Box 3.3: Farm Input Subsidies Narrowing Price Disincentives: The Case of Maize in Malawi

Over the last decade, the Malawian government has implemented various measures targeting the maize sector, including price controls, export bans, and the provision of subsidized inputs through the Farm Input Subsidy Programme (FISP). Price controls to protect consumers and ensure maize affordability by the poorest and export bans have contributed to lower maize prices and determined a negative NRP of -31 percent on average for 2005–2021. At the same time, subsidies (mainly on inputs) on maize have partially narrowed the price disincentives stemming from trade and market policies (Figure 3.2).

Indeed, when budgetary transfers (or subsidies) to the maize producers are considered, the average NRA is -20 percent on average, 6 percentage points higher than the NRP. This indicates that price disincentives faced by maize farmers are less significant when accounting for the subsidies that they have received. In absolute terms, subsidies on maize accounted for 33.5 billion MWK over the period, with a record high of 72.8 billion MWK in 2016.

Figure 3.2: Nominal Rate of Protection and Assistance for Maize in Malawi



Source: MAFAP database 2017.

MDG Analysis and Interpretation

The MDG is the ACG expressed as a percentage of the producer price. It estimates the effect of value chain inefficiencies or excessive market access costs on farm gate prices. To interpret the MDG, we need to understand how excessive market access costs can affect producer prices. The effect is different depending on whether the commodity is imported or exported.[29]

A negative MDG means that commodity producers are penalized by value chain inefficiencies, which prevent them from receiving potentially higher prices. The MDG is always negative for exported commodities. In this case, removing such inefficiencies through improvements in roads and other infrastructure, removal of informal fees or bribes, and reduced profit margins for traders would improve price transmission and farm gate prices and gains. For imported commodities, a negative MDG means that inefficiencies between the border and the PoC, which favor farmers, do not cancel out the inefficiencies between the farm gate and the wholesale level. As a result, farmers receive lower prices than those they would receive under a more efficient value chain scenario with reduced market access costs.

A positive MDG is only possible for imported commodities. In this case, it means that the total excessive access costs from the border to the wholesale level (PoC) are higher than the total excessive

[29] For imported commodities to arrive at a country's wholesale market, or at the point where it competes with the local produced product, it incurs marketing costs such as transport and storage that may increase the price of the imported commodity against the locally-produced commodity. This acts as a form of protection and support to farm gate prices. On the other hand, excessive market costs to move locally-produced commodities from the farm gate to the wholesale level will negatively effect producer prices. The sum of these two opposite effects on producer prices may be positive or negative, depending on the magnitude of inefficiencies in each segment.

access costs from the wholesale to the farm gate. In other words, inefficiencies penalize the imported good more than they penalize the locally produced commodity. If these inefficiencies were fully removed, marketing costs of imported products would reduce, lowering prices. As such, it could force local producers to sell at a lower price.

An MDG near zero has a different meaning for imported and exported commodities. For imported commodities, it means value chain inefficiencies from border to PoC and the inefficiencies from PoC to farm gate cancel each other out. From a producer's perspective, this is neither good nor bad. However, this zero MDG masks the presence of large inefficiencies in the value chain, suggesting that there is scope for cost reduction, benefiting consumers, for example. For exported commodities, assuming that it was possible to access the proper information to adjust market access costs downward, an MDG close to zero suggests that the value chain is very close to being efficient. In that case, inefficiencies are minimal and are not generating price disincentives to farmers.

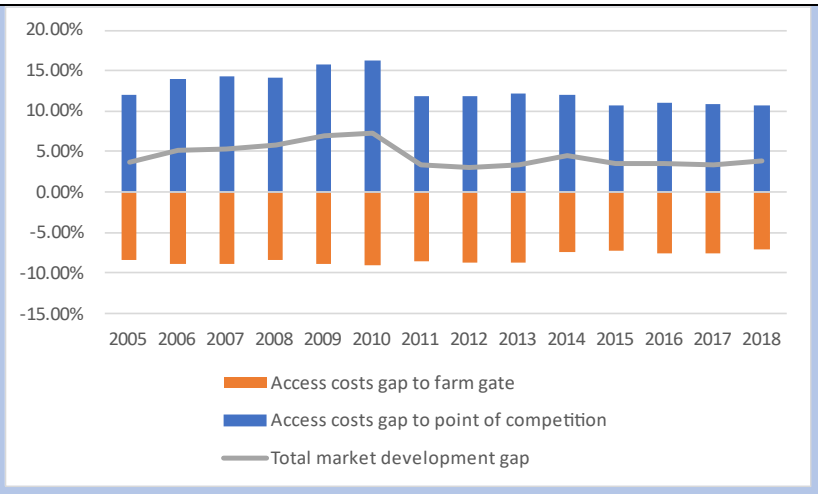
Box 3.4 contains an analysis of MDG for an imported good and exported commodity.

Box 3.4: The Market Development Gap for Imported Rice in Burkina Faso and Exported Cotton in Mozambique

For rice in Burkina Faso, the ACG at the PoC (the main wholesale market) shown in green in Figure 3.3, is positive, as the commodity is imported. This gap accounted for more than 10 percent of the farm gate price over the period. High marketing costs for traders protect farmers and may positively impact their price incentives. On the contrary, the ACG at the farm gate is negative (red bars), averaging around 8 percent, as farmers face higher marketing costs than in an efficient market scenario. In this scenario, transport costs have been reduced to match those in South Africa, intermediary profit margins are fairer (i.e., halved), and farmers sustain no informal costs or fees. The sum of the two gaps results in the total access cost gap, expressed as the share of the producer price, represents the MDG (black line). In this case, the MDG is positive, averaging about 5 percent, because the gap at the PoC was larger than at the farm gate.

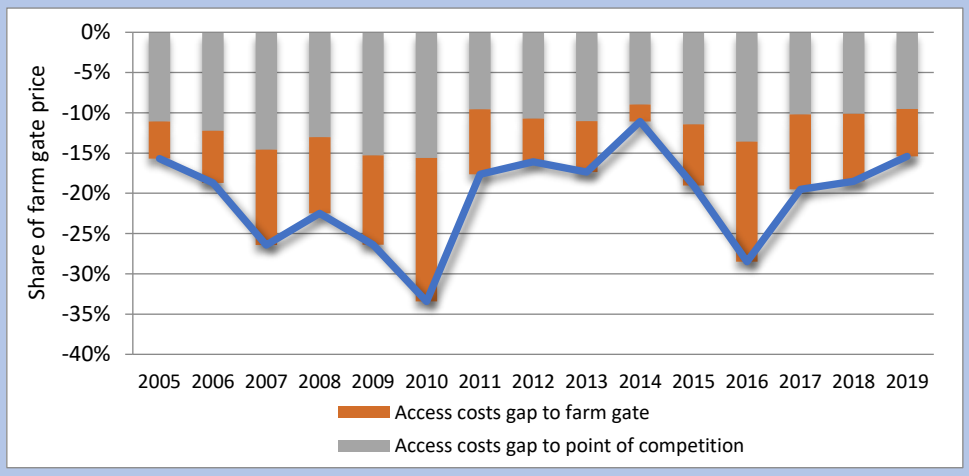
In Figure 3.4, both ACGs are negative for cotton in Mozambique, as high marketing costs for an exported product always negatively impact producer incentives. For the period, the high marketing access costs represent an average of 20 percent of the farm gate price, suggesting that with the necessary policies in place to narrow market access costs—i.e., infrastructure investments, better information, and reduced informal costs borne by farmers—cotton producers could have benefited from prices an average of 20 percent higher than those faced in the actual scenario.

Figure 3.3: MDG for Rice in Burkina Faso



Source: MAFAP 2021.

Figure 3.4: MDG for Cotton in Mozambique



Source: MAFAP 2021.

3.2. GUIDE FOR PRICE INCENTIVE ANALYSIS

This section provides additional guidance on initiating and conducting a price incentives analysis. It includes a section on preparatory steps for identifying and collecting the necessary data and detailed steps on the computation.

3.2.1. Preparing for Price Incentive Analysis

Selecting Commodities for Analysis

The process of selecting commodities includes the following steps:

a) Rank commodities based on production value, that together cover at least 70 percent of total agricultural production value. Reaching a large share of the value of production allows us to build meaningful and representative aggregate estimates for the entire sector. However, it might be difficult to achieve this target in data-scarce contexts.

b) Include key export and import commodities that account for more than 5 percent of the total imports or exports.

c) Include staples or commodities identified by the government as strategic from a food security perspective.

d) Consider specific commodities of interest to the government due to their strong market potential and/or high prospects for future investments.

e) Review the list and check data availability for the identified commodities.

Table 3.4 shows an example where the two products (shaded in blue) represent 78 percent of the total production value in the period and could be considered candidates for analysis. Certainly, other products can be analyzed, depending on the scope of the study and data availability.

Table 3.5: Share of Commodities in Agricultural Production Value in Bangladesh, (Average for 2011–2020)

Product Share in Total Value of Agricultural Production	**(%)**
Rice	69
Potatoes	9
Areca nuts	4
Onions and shallots, dry (excluding dehydrated)	4
Maize	3
Mangoes, guavas and mangosteens	3
Wheat	2
Green garlic	2

Source: FAOSTAT 2023.

Once commodities are selected for PI analysis, the next step is to review each commodity's value chain context and functioning. The aim is to understand the value chain and identify key stakeholders and policies, and the influence of stakeholder choices. This involves a comprehensive look at where the commodity is grown and harvested, its movement toward the market – through intermediaries including producers' organizations, processors, transporters, wholesalers, and retailers – and to the final consumers and border. This process also aids in identifying potential sources for collecting data on prices, access costs, volumes, and values of production, consumption, and trade.

Reviewing production data of a commodity in a country helps understand domestic supply dynamics, which influence prices and trade. It helps us understand the level and trend of production and indicates the factors affecting productivity. Reviewing the trend and level of consumption of the commodity's different forms, e.g., unprocessed, processed, or subproducts, is useful for understanding the commodity context and determining the share of domestic production that is locally consumed in the primary or processed form. This analysis also highlights if there is a preference for a certain type of commodity, i.e., a preference for the locally grown or imported commodity.

Determining the Trade Status of the Analyzed Commodity

Before estimating the PG and its associated effects, it is important to identify whether the analyzed product is exported or imported. This is necessary to establish the RP at a specific level in the value chain.

If the product is a net export (domestic production is larger than domestic consumption), the RP corresponds to the free on board export price (FOB). If it is a net import, the RP corresponds to the cost, insurance and freight (CIF) import price.[30] The Apparent National Consumption measure is the suggested method to calculate the trade position. Table 3.6 shows an example of this measure where the estimated level of consumption for barley is higher than production. It is clearly an importable product in this case, meaning the appropriate RP will be the import price (CIF). If consumption is less than production, it is assumed that it is an exportable product, and the export price (FOB) will be used as a reference.[31]

Additionally, assessing the commodity's trade intensity will be helpful. The concept of trade intensity is used to evaluate the degree of openness of an economy for a specific commodity. Trade intensity evaluates the relative share of trade over the apparent domestic consumption of a commodity by year, as defined in the equation below.[32]

$$TI = \frac{X_i + M_i}{Y_i + M_i - X_i} \times 100$$

Where TI is the trade intensity, X_i is the volume of exports of commodity *i*, M_i the volume of imports of commodity *i*, and Y_i is the domestic production of commodity *i*.

If TI is above 10 percent, the import or export price will play a sufficiently important role in domestic price formation. If TI is below 10 percent, this can still be the case, but alternative border prices should be sought to test how the resulting reference prices differ.[33] In the example above, data shows that trade intensity is relatively low; however, since the absolute quantities of imported rice are significant—over 900 thousand tonnes in 2018—CIF prices are used as border prices for the analysis.

The selection of the product for which the border price (CIF or FOB) will be taken will depend on traded quantities and the tradability of the product. While analyzing the least transformed product might simplify the process and require fewer conversion factors, obtaining a reliable border price is crucial. This is only attainable for the specific type of product traded at the border. For instance, certain commodities are not traded in their raw form (e.g., refined sugar instead of sugarcane or meat instead of live animals). In such cases, the relevant border price pertains to their processed form.

Review of the Value Chain Context

Qualitative information can help review the value chain context of commodities and identify the trade patterns and policy measures affecting the commodities. Reviewing the value chain functioning allows the identification and understanding of the representative market pathway for the commodity, which includes agents and a range of activities involved from production to final market destinations, both national and international. This requires a comprehensive look at where the commodity is grown and

[30] The calculation of the CIF equals value of imports of the product analyzed divided by the imported volume of that product. Similarly, the FOB price equals the value of exports of the product divided by the volume exported.

[31] In a strict sense, the calculation of apparent consumption must include inventories, so that the calculation must be: Apparent Consumption=(Production)+ (Imports)+ (Inventories)-(Exports).

[32] Alternatively, trade intensity can also be calculated over domestic production.

[33] Alternative border prices for an imported product could be the FOB price at the main trade partner plus freight and insurance costs, or prices in a wholesale market close to the border.

harvested, its movement toward the market—through intermediaries including producers' organizations, processors, transporters, wholesalers, and retailers—and to the final consumers and border.

Quantitative data needed to compute price incentive indicators include prices, access costs, volumes and values of production, consumption, and trade. Price data include border and domestic prices at different points of the value chain. Market access costs are obtained at different value chain points, at the farm gate, wholesale, and retail levels. These include transport, handling and processing costs, taxes, and other fees.

Reviewing production data of a commodity in a country helps understand domestic supply dynamics, which influence prices and trade. It provides insights into the level and trend of production, offering indications of productivity and the factors influencing it. Reviewing the trend and level of consumption of the different forms of commodity, such as unprocessed, processed, and subproducts, is useful for understanding the commodity context and determining the share of domestic production consumed locally in the primary or processed form. This analysis also highlights if there is a preference for a locally grown or imported commodity.

Trade data for the commodity analyzed is required on import and export volumes and values. Trade data will help determine the trade status of a commodity, whether it is an imported or exported product, largely or thinly traded, and its import dependence. The latter is calculated as the share of imports over total domestic supply, i.e., domestic production plus imports. This data will also be useful to determine the export (FOB) or import (CIF) price of a specific commodity.

First, it is important to identify which statistics are considered the official agricultural statistics for the studied country and the agricultural products for which information is available. Basic information includes production volume, producer prices, export level (volume and value), and import level (volume and value) for the products to be analyzed.

Table 3.6 provides a non-exhaustive list of the primary and alternative sources of information for each key variable needed to start the computation of price incentive indicators for two hypothetical commodities, wheat and barley.

Table 3.6: Commodity Data, Sources, and Examples for Wheat and Barley

Symbol	Description	Units	Derived or Data	Data Source	Wheat	Barley
QP_i	Level of production	000 t	Data	• Ministry of Agriculture • The institution in charge of national statistics • International organizations such as FAO in FAOSTAT • Foreign Agricultural Service (FAS), USDA	250	110
VP_i	Value of production (at the farm gate)	LC million	Derived: (QP_i * PP_i) or data	• Ministry of Agriculture • The institution in charge of national statistics • International organizations such as FAO in FAOSTAT	515	139
QC_i	Level of consumption	000 t	Derived: (QP_i + QM_i – QX_i + STK_i) or data	• Ministry of Agriculture • The institution in charge of national statistics • Foreign Agricultural Service (FAS), USDA	200	160

QM_i	Imports	000 t	Data	• Ministry of Agriculture • Ministry of Economy, Trade, or Customs • The institution in charge of national statistics • Foreign Agricultural Service (FAS), USDA	50	40
QX_i	Exports	000 t	Data	• Ministry of Agriculture • Ministry of Economy, Trade, or Customs • The institution in charge of national statistics • Foreign Agricultural Service (FAS), USDA	80	0
STK_i	Stock change	000 t	Data	• Ministry of Agriculture • Data from relevant companies • Financial institutions • Foreign Agricultural Service (FAS), USDA	-20	10
PP_i	Producer price (farm gate)	LC/t	Data	• Ministry of Agriculture • Ministry of Economy, Trade, or Customs • The institution in charge of national statistics • International organizations such as FAO (FAOSTAT)	2,060	1260

Identifying Policy Measures Affecting the Commodity

Reviewing government planning documents can help identify the relevant policies affecting the commodity. This aids in interpreting price incentive indicators, encompassing trade policies, price controls, and other regulations.

Various policy measures (interventions) affect the price producers receive. These measures do not necessarily involve a monetary outlay by the government since they regularly come from implementing regulations or decrees. Among the most frequent policy measures of this nature are the following:

a) **Policies that increase the domestic producer price**, e.g., import tariffs/quotas, export /subsidies/donations. Establishment of minimum prices, public purchases, and others
b) **Policies that reduce the domestic price,** e.g., export taxes/quotas, the establishment of maximum prices, and others

Table 3.7 shows examples of such policies and sources of information on the policies.

Table 3.7: Examples and Sources of Information on Policies Affecting Prices, by Policy Type

Objective	Policy Type	Example(s)	Possible Source of Policy Information
Increase Domestic Prices	Import tariffs or quotas	• A 10 percent ad valorem* tariff on corn imports • A Maximum quota of 10,000 tons of corn imports per year	WTO Ministry of Commerce/Finance
	Export subsidy	• Support of US$10 per exported ton of wheat	Ministry of Commerce/Finance

		• Support of 50 percent export transportation cost	
	Minimum price	• Decree to impose a minimum price of US$7 per liter on milk producers	Ministry of Commerce and Ministry of Agriculture
Decrease Domestic Prices	Export tariffs or quotas	• 10 percent ad valorem tariff for soybean exports • A fixed rate of US$100 per exported ton of rice	WTO Ministry of Commerce or Finance
	Maximum price	• Decree to impose a maximum price of US$120/ton on bovine producers	Ministry of Commerce or Agriculture
	Government purchases	• Decree for the government to purchase at least 50 percent of the national coffee production	Ministry of Commerce or Agriculture

Note: * = an *ad valorem* tariff, where the customs duty is calculated as a percentage of the product's value.

3.2.2. Price Gap Estimation

The first step to calculate the price incentive indicators is to obtain the RP, defined by the commodity's trade status and intensity, as discussed above. The CIF or FOB price, depending on whether the commodity is imported or exported, is used, as mentioned in section 3.1.2. Next, access costs are added or subtracted from the border price to first "bring" the price to the point of competition or wholesale level and ultimately to the farm gate level. Adding or subtracting access costs will depend on trade status, as follows:

At the wholesale level:

$$RP_{wh} = \left(P_{b(loc)} \times QT_{wh} \times QL_{wh} \right) + AC_{wh} \text{ [}\textit{if the commodity is imported}\text{]}$$

$$RP_{wh} = \left(P_{b(loc)} \times QT_{wh} \times QL_{wh} \right) - AC_{wh} \text{ [}\textit{if the commodity is exported}\text{]}$$

At the farm gate level:

$$RP_{fg} = \left(RP_{wh} \times QT_{fg} \times QL_{fg} \right) - AC_{fg}$$

where RP_i is the RP at the corresponding point in the value chain, $P_{b(loc)}$ is the border price (CIF or FOB) in local currency, AC_i are the access costs for the corresponding section in the value chain (border-wholesale, wholesale-farm gate), QT and QL are quantity and quality conversion factors used to account for differences in quantity and quality between traded and domestically produced commodities in each section of the value chain.

After constructing the reference price at the various levels, the PG is calculated, the difference between the RP and the domestic price (P) at the farm gate or wholesale:

$PG_i = P_i - RP_i$ where $_i$ = wholesale or farmgate

When that gap is not equal to zero, a policy or other market distortion affects domestic prices.

Using the practical example of imported rice in Bangladesh, we can follow the steps taken to calculate the PG:

- Rice was identified as a net import in 2019, therefore, the border price used is the CIF price;

- For rice imports, Benapole (the border crossing with India) is considered the frontier or main port of entry;
- Producer prices in the Naogaon region (main producing area) are collected from the Department of Agricultural Marketing of the Ministry of Agriculture;
- To calculate RP at the farm level, transport costs are calculated as transport unit costs per kilometer and multiplied by the corresponding distance between Benapole and Dhaka (wholesale market) and between Dhaka and Naogaon;
- Additionally, margins for importers are assumed at 10 percent of the CIF price due to a lack of better information;
- Processing (milling) costs and margins for processors are obtained from a literature review, and added to the other access costs from Dhaka to Naogaon;
- A quantity adjustment factor is used to account for weight changes during milling;
- Using the data from the steps above, the RP at the farm gate level is obtained in local currency (BDT);
- Finally, the PG at the farm gate is estimated as a difference between the RP and the domestic price at the farm gate and wholesale level.

The positive value of the PG indicates that the domestic price is higher than the RP. This gap could result from a trade or market price policy (see Table 3.8). We know that in Bangladesh, since 2015, the government introduced a 20 percent import duty on rice to protect producers against declining rice prices. This policy has supported the domestic price of the product *vis-a-vis* the international equivalent (or reference).

Table 3.8: Key Data and Calculation of the PG for Imported Rice in Bangladesh, 2019

Symbol	Description	Units	Value	Source: Formula for Deriving/Data
P_b	**Border price**	**BDT/T**	**33,807**	**CIF= ($Value_i$/$Quantity_i$)*1000**
AC_{wh}	**Access costs from border to wholesale**	**BDT/T**	**8,373**	**a+b**
a	Transport costs	**BDT/T**	4,992	Data
b	Margins (importer)	**BDT/T**	3,381	Assumption 10% CIF
AC_{fg}	**Access costs from wholesale to farm gate**	**BDT/T**	**11 135**	**c+d+e**
c	Transport costs	**BDT/T**	4,910	Data
d	Processing costs (milling)	**BDT/T**	3,648	Data
e	Margins (processors)	**BDT/T**	2,576	Data
QT_{fg}	Quantity adjustment factor	Ratio	0.67	Data: Milling ratio to convert paddy to milled rice.
RP_{fg}	**Reference price**	**BDT/T**	**17,337**	$RP_{fg} = RP_{wh} * QT_{fg} - AC_{fg}$ $RP_{fg} = (P_b+AC_{wh}) * QT_{fg} - AC_{fg}$
P_{fg}	**Producer price (at the farm gate)**	**BDT/T**	**20,275**	**Data**
PG_{fg}	**Price gap**	**BDT/T**	2,938	$P_{fg} – RP_{fg}$

Table 3.9 presents another practical example of an export product with marketing adjustments. It highlights the case of a net exporter country of wheat in a country with import tariffs. Some additional adjustments, described below, are based on technical parameters. There are several aspects to consider:

- Feed wheat and milled wheat are produced. While there are import tariffs for milled wheat, there are no restrictions on feed wheat imports.

- The border price is not comparable to the average price received by producers due to the difference in grain varieties.
- Half of all wheat produced in the country is milled, and half is used for feed.
- The country is a net wheat exporter, exporting 80 percent of total feed wheat production.
- The assumption is made that the conversion factor between the two wheat varieties is 1.05, making both prices comparable.

As shown in Table 3.9, the PG at the farm gate is positive 46, meaning the domestic price is higher than the RP. This indicates a transfer to the producer derived from implementing a price policy.

Table 3.9: Calculation of the Price Gap for a Net Exporter of Wheat

Symbol	Description	Units	Value	Source: Formula for deriving or Data
QP_i	**Level of production**	**000 T**	**200**	QP_{aw}+QP_{ss} or Data
QP_{aw}	Production autumn-winter	000 T	10	Data
QP_{ss}	Production spring-summer	000 T	190	Data
VP_i	**Value of production (farm gate level)**	**LC million**	**65**	**QP_i * PP_i or data**
QC_i	**Level of consumption**	**000 T**	**100**	**QP_i + QM_i - QX_i + STK_i or data**
PP_i	**Producer price (farm gate level)**	**LC/T**	**325**	**VP_i/QP_i or data**
BP_i	**Border price**	**LC/T**	**289**	**(VX/QX) *1000 or data**
VX	Value of exports	LC million	29	Data
QX	Quantity of exports	000 T	100	Data
QA	**Quality adjustment**	**Ratio**	**1.05**	**(a+b*(1+ΔP))/(c+d*(1+ΔP))**
a	Share of feed wheat in total production	Ratio	0.50	Data
b	Share of milling wheat in total production	Ratio	0.50	Data
c	Share of feed wheat in total exports	Ratio	0.80	Data
d	Share of milling wheat in total exports	Ratio	0.20	Data
ΔP	Quality price differential between milling and feed	ratio	0.17	Data
MM	**Marketing margin**	**LC/T**	**24**	**T1 + T2 + S**
S	Processing costs (cleaning and drying)	LC/T	10	Data
T1	Handling and transportation (wholesale/border)	LC/T	12	Data
T2	Handling and transportation (farm/wholesale)	LC/T	2	Data
RP_i	**Reference price**	**LC/T**	**279**	(BP * QA) - MM
PG_i	**Price gap**	**LC/T**	46	PP_i - RP_i

3.2.3. The Nominal Rate of Protection

The nominal rate of protection (NRP) is the PG divided by the RP at the farm gate or wholesale level.

$$NRP_i = \frac{PG_i}{RP_i}$$ i = wholesale, retail, or farmgate

Table 3.10 presents an example using the previously-mentioned data on rice in Bangladesh. In this example, the NRP is 17 percent, i.e., the domestic price is 17 percent above the RP. This indicates the likely presence of policy measures to protect domestic producers, which aligns with the 20 percent duty on rice imports, as mentioned before.

Note that the domestic price and, therefore, the NRP may be affected by other variables, not only those related to protectionist agrifood policies. Similarly, the international price may change due to exchange rate movements. For instance, while a protectionist policy may be in place, external factors like a climate shock reducing supply can also contribute to price hikes. In such situations, the analyst must account for these factors in the analysis.

Table 3.10: NRP at the Farm Gate for Rice in Bangladesh, 2019

PG (BDT/T)	RP (BDT/t)	NRP
(1)	(2)	(1)/ (2)
2,938	17,337	0.17

Note: PG = Price gap; BDT = Bangladesh Taka; RP = Reference price.

3.2.4. The Nominal Rate of Assistance

The NRA is the sum of the PG at the farm gate and budgetary transfers to producers divided by the RP.

$$NRA_{fg} = \frac{(PG_{fg}) + BOT}{RP_{fg}} \times 100$$

The NRA captures how much trade and market measures and direct subsidies to producers have raised gross returns to farmers above what they would be without government assistance. As shown in Table 3.11, the NRA for rice in Bangladesh is 23 percent, 5 percentage points higher than the NRP, indicating that farm subsidies add to the support provided by the import protection measures.

Table 3.11: NRA for Rice in Bangladesh, 2019

PG (BDT/T)	RP (BDT/T)	Other Budget Transfers (BDT/T)	NRA
(1)	(2)	(3)	(1+3)/2
2,938	17,337	1,037	0.23

Note: PG = Price gap; BDT = Bangladesh Taka; RP = Reference price.

3.2.5. The Market Development Gap

The MDG is a concept that refers to the excessive marketing costs and inefficient price transmission resulting from market failures, and not only by agricultural support policies or other market conditions. Market failures might include poor transportation or other physical infrastructure, monopolistic market structures, agents' noncompetitive behavior in the value chain, or information that generates asymmetries in the bargaining power between producers and buyers. These inefficiencies could be due to missing policy interventions, e.g., regulation to ensure a more balanced, transparent, or fairer market price, or suboptimal investment in the sector, e.g., infrastructure.

Inefficiencies could also result from other market conditions that directly impact production costs or products' selling prices.

To simulate a potential situation of improved efficiency and reduced costs, the actual (or observed) access costs are adjusted downward to the level of an efficient market. This can be done using the following assumptions: (a) omission of all transfers, taxes, and fees not corresponding to a service, such as informal marketing costs and bribes; (b) reduction of access costs of processing, handling, and transport, if they are deemed too high or result from suboptimal functions in the value chain; (c) reduction of traders margins to a fairer level, if these are deemed excessive. Information for 'adjusting' these cost variables downward often results from academic research, private studies, or surveys.

The difference between the adjusted and the observed/actual costs constitutes the ACG, which is calculated from the farm gate to the wholesale level and from wholesale to the border. These ACGs might affect farmer incentives differently according to the commodity's trade status. For an imported product, excessive access costs from the border to the consumption point may make imported commodities more expensive than domestic ones; this represents a benefit to farmers, in principle. The opposite is true for an exported product, where high costs from farm to border represent an obstacle to being more competitive.

$$MDG(imported)_{\%} = \frac{MDG_{fg}}{P_{fg}} = \frac{ACG_{fg} - ACG_{wh}}{P_{fg}}$$

$$MDG\ (exported)_{\%} = \frac{MDG_{fg}}{P_{fg}} = \frac{ACG_{fg} + ACG_{wh}}{P_{fg}}$$

Table 3.12 shows detailed ACG calculation steps for rice at the wholesale and farm levels in Bangladesh. Once both access cost gaps are calculated, the MDG can be calculated in absolute terms (847 BDT in this case) by subtracting them since it is an imported commodity.

Expressing the ACG in relative terms will help us compare products, countries, or over time. To calculate the relative MDG, the already-obtained sum of both gaps is used as a proportion of the price at the farm gate. As such, this indicator quantifies the size of inefficiencies as a share of the producer price or how much market inefficiencies potentially affect farm revenues.

Table 3.12: Calculating MDG (Absolute Terms)

Access costs	Access costs at the wholesale level (a)			Access costs at the farm level (b)			MDG, absolute (c)	Producer price	MDG, share
	Actual	Adjusted	Gap	Actual	Adjusted	Gap			
	(1)	(2)	3=(1-2)	(4)	(5)	6=(4-5)	7= (3+6)	(8)	(7)/(8)
Transport Costs	4,992	2,934		4,910	2,886				
Margins Costs	3,381	1,690		2,576	1,698				
Processing Costs				3,648	3,648				
Total	8,373	4,624	-3,749	11,135	8,233	-2,902	847	20,275	0.04

MODULE 4: METHODS TO EVALUATE POLICY IMPACTS

This module aims to introduce readers and provide some guidance on how measures of support and indicators described in Modules 2 and 3 can be complemented and used in additional analysis to better understand the impact of agricultural policy support. For example, assessing the efficiency and effectiveness of the public expenditure programs can identify governance issues. This information can guide the repurposing of programs to provide support through more efficient mechanisms. Alternatively, an institutional review can be conducted to understand how budgets are operationalized and identify bottlenecks. Similarly, if the objective is improving nutrition or greening of the production system, information on PEA and PI can be used to establish the impact of the support programs and identify how budgets and policies can be repurposed to achieve these goals. These deep dives are an important analytical tool for identifying successful entry points for repurposing support, which the "core" AgPERs may be unable to identify.

This module, however, does not provide an exhaustive list of available methods and models, nor is the intention to provide an authoritative list of approaches that should be used. It is also not intended to provide a detailed tutorial on how to use specific methodologies; instead, the aim is to introduce readers to this stream of work as it can provide key insights into what type of repurposing options should be implemented to achieve the multiple objectives of poverty reduction, food and nutrition security, and environmental sustainability. Note that this is extremely challenging, especially in developing countries where policymakers work in an environment lacking sufficient data and evidence. They have limited tools to generate the necessary evidence for making informed policy decisions to achieve diverse goals through agricultural transformation.

Importantly, the lack of tools to support policymakers makes implementing the repurposing agenda difficult for various reasons. First, the lack of tools means that chosen policies are often implemented without an in-depth ex-ante *or* ex-post assessment of various options. This implies that, from the outset, it is unclear whether the chosen policy is the best option. Similarly, the lack of ex-post evidence makes it much more difficult to correct course if the chosen option is not fit for purpose or does not have the anticipated effect. Second, in most contexts, sectoral policies are generally based on their expected impact on specific sectoral outcomes. While individual sectoral outcomes are likely important, focusing on these may lead to overlooking trade-offs and cascading effects on other equally vital indicators beyond the sector. This highlights the importance of having a set of tools capable of assessing the likely impact of specific policies on multiple sectoral outcomes and metrics beyond the sector, such as other economic, environmental, and health indicators.

Progress has been made in modeling how repurposing agricultural support affects multiple objectives (Laborde et al. 2021; FAO, UNDP, & UNEP, 2021; Gautam et al. 2022). Recent modeling work has been carried out at the global level using IFPRI's MIRAGRODEP model; as such, it does not provide specific country-level recommendations. Adapting and implementing this work at the country level is essential to offer relevant policy recommendations. A recent study by FAO aimed to answer this question by using a dynamic CGE model and multicriteria decision-making techniques. The study assessed how Ethiopia could repurpose its budgets to increase value for money and effectively pursue multiple objectives: affordable healthy diets, increased productivity, and improved livelihoods (Sánchez & Cicowiez, 2022a).

Eventually, the choice of methodology will depend on several factors: the policy(ies) to be analyzed, the objectives of interest, the available resources (financial and human), and the time to carry out the analysis. We will start by highlighting some aspects that policymakers must consider before conducting the analysis. We will then look at the different tools available to policymakers, starting from simulation-based tools that consider the expected effects of policies ex-ante before moving to methods used to evaluate policies ex-post. Finally, we will discuss the usefulness of conducting

qualitative analyses to enrich the quantitative analyses. Given the focus on repurposing and the fact that it involves simultaneously achieving several economic, social, and environmental targets, we then discuss the importance of trade-offs and how these can be incorporated into country-level analyses. Finally, given the complexity of choosing a tool, we will provide some general steps and advice to help decision-makers choose an appropriate tool to assess the impact of potential policy changes in which they may be interested.

4.1. KEY CONSIDERATIONS TO GUIDE SELECTION OF THE MOST APPROPRIATE TOOL

4.1.1. Defining the Outcome(s) of Interest and Analytical Instruments

Before conducting any assessment, it is important to clarify the main purpose of the analysis, the outcomes of interest, and the set of policy instruments considered for evaluation.

It is important to identify the intended purpose and use of the tool from the outset, as this greatly influences the selection of the methodology, the data collection, and the features of the analytical outputs. For instance, qualitative methods can be considered if the aim is to understand processes, governance structures, and institutional set-ups that contribute to a policy's success. These tend to be less data-intensive but can provide analytical depth of the mechanisms and dynamics that led to the policy's success (or failure) without necessarily quantifying the impacts. On the other hand, if the evaluation focuses on estimating the impacts of a (set of) policy instrument(s), then we must resort to quantitative methods. Even within quantitative methods, the choice would be influenced by factors such as whether the analysis is considered ex-ante or ex-post, the object, and the time horizon.

After deciding the purpose of the evaluation, it is important to understand what defines a successful policy, which will then be used as an outcome of interest. A narrow set of outcomes could include agricultural productivity and value-added growth, and rural employment. In contrast, broad outcomes could span multiple spheres, including climate, health, and nutrition. This choice is not harmless: it can lead to a very different set of tools being used and a drastically different assessment of whether the policy is successful.

Given that this toolkit focuses on repurposing agrifood policy support, a narrow definition of "success" confined to agricultural productivity growth is inadequate. Other important dimensions include poverty reduction, environmental impact, and healthy diets. The mix of dimensions is challenging, as there is increasing evidence that what works for agriculture may not work for other dimensions. Fertilizer subsidies, for example, are generally a good illustration of the importance of assessing multiple outcomes. In terms of increasing output, results from evaluations typically find that, while not very cost-effective (Jayne et al. 2018), fertilizers generally increase production and productivity. However, recent analyses have found that this may come at the expense of the environment, health, and nutrition (FAO et al. 2021; Springmann & Freund 2022). The success of such subsidies thus depends on the metrics used to define their success. There are models to address single vs. multiple interventions,[34] i.e., bundles of policies/investments and/or interventions. Other models address single- vs. multiple outcomes, i.e., outcomes across different dimensions, such as health or the environment.

Given the different capabilities of different models, one needs to define from the outset the types of policy interventions—for example, trade and market policies, budgetary/fiscal policies, and regulatory/enabling environment—to be analyzed in isolation or as part of a wider bundle of policy instruments. The types of policy instruments are critical to determining the most appropriate tool. For

[34] Interventions is used in the broad sense in this case.

instance, relatively few tools can analyze the effects of bundles of policy instruments. At the same time, several evaluation designs are precluded by definition for certain policies that affect everyone in a country. Similarly, when international spillover effects of national policies or policy reforms happening elsewhere are considered relevant for a country, it would require using tools that allow for global modeling.

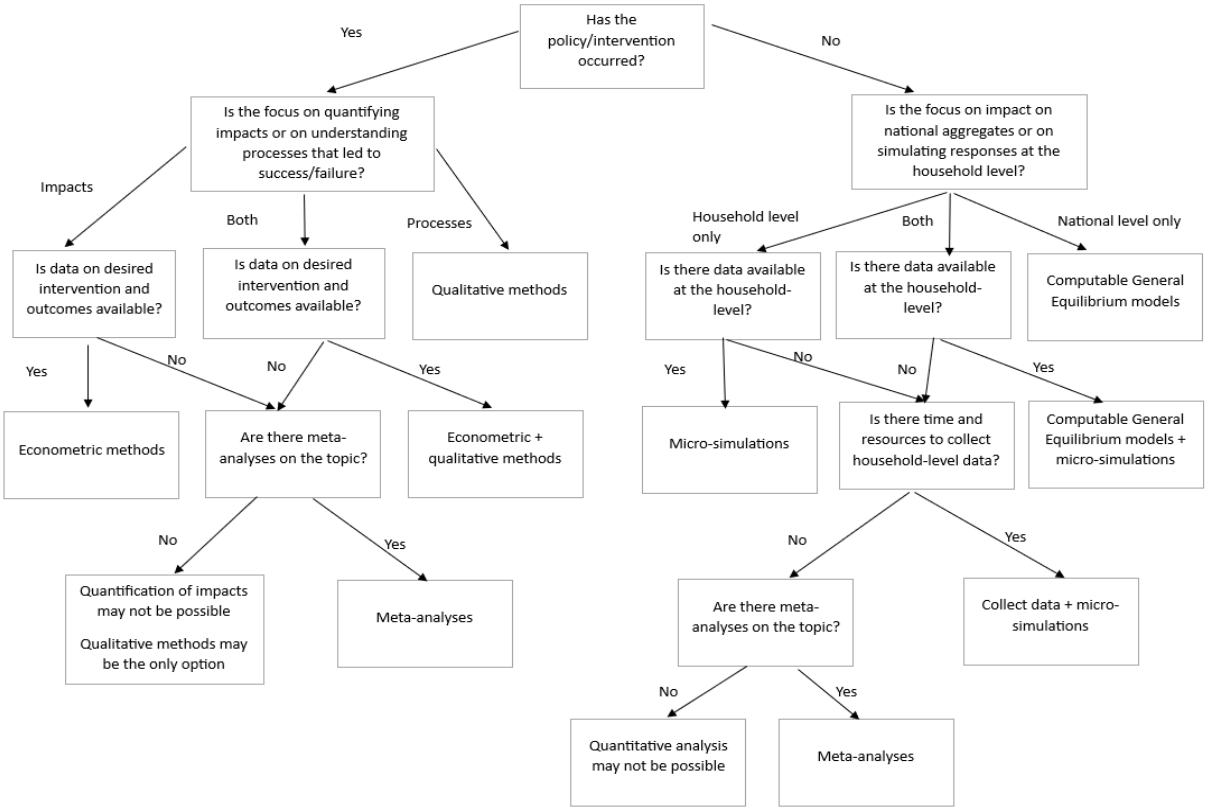
Finally, one must also define how much time and resources they will allocate to analyzing these effects. Detailed and comprehensive analysis often requires primary data collection, substantially increasing the costs and time to complete. While this may be the "ideal" setting, many policy decisions are time-bound; policymakers may not have six months to one year to obtain the results they need. If such a timeline is incompatible, expectations must be re-adjusted. The focus should be on doing the best possible analysis with already-available data or using qualitative methods to inform the decision-making process.

In summary, when deciding on the most appropriate tool to be used for a given assessment of an analysis, it is useful to bear in mind the following questions:

a) What is/are the main outcome/s of interest that define the success of a policy?
b) Has the policy already happened (ex-post), or will it happen in the future (ex-ante)?
c) Is quantifying the impacts the main focus, or is it understanding the underlying factors that led to a policy's success or failure?
d) What are the available data?
e) How fast are results needed, and how many resources (human and financial) are available for the exercise?
f) What policies is the policymaker willing to consider/implement, e.g., regulatory, budgetary, trade, and market policies? Are there any financial or other constraints, such as WTO rules, that could prevent governments from pursuing rewarding policy options?

Figure 4.1 below provides a simplified decision tree for choosing the most appropriate method for the analysis.

Figure 4.1: Analytical Approach Decision Tree



4.1.2. Available Methodological Approaches

This section reviews some of the most common approaches classified into three main groups: econometric, simulation, and qualitative. As will be discussed, different models are likely better suited for different combinations of objectives, outcomes, and policy instruments to be analyzed. As such, these tools will likely play different roles in informing the repurposing agenda.

Table 4.1 summarizes each group of approaches. Economywide modeling tools are probably the most suitable for simulating the ex-ante macro-level effects of multiple policies on a wide range of outcomes and identifying potential trade-offs. However, these economywide models are only as good as their underlying parameters. Econometric evidence is crucial to calibrate general equilibrium models. In addition, policymakers are generally interested in going beyond an average national effect to understand the heterogeneity of outcomes across space and households, which geospatial techniques can provide (Gouel & Laborde 2021; Costinot et al. 2016). Econometric methods are best employed to assess impact during and after policy change implementation. Finally, qualitative approaches help inform modeling approaches, explain results from quantitative approaches, and identify processes that could support or deter a successful repurposing agenda. The next subsection lists some of the most popular methods across the three approaches.

Table 4.1: Summary of Strengths and Limitations of Different Modeling Approaches

Approach	Strengths	Limitations	Examples
Simulation Models	• Can handle multiple policies and outcomes • Captures economywide effects of policies • Can capture trade-offs between different outcomes	• Difficult to capture heterogeneity without combining it with simulation methods • Outcomes (especially environmental ones) that are generally modeled are quite limited	Gautam et al. (2022) simulated the impact of country-specific repurposing scenarios on six key indicators (national income, agricultural production volume, poverty, healthy food prices, agricultural emissions, and agricultural land). They found that, while repurposing could lead to improvements in these indicators across all countries, the magnitude of potential effects of repurposing varied greatly across countries. Similarly, Sánchez and Cicowiez (2022b) looked at the potential effects of optimizing public expenditures to achieve different objectives. The authors found substantial potential benefits to improving expenditure composition but trade-offs across dimensions of agricultural transformation. This is especially true when including nutrition outcomes, as the commodities targeted by public expenditures change substantially.
Econometric methods	• Quantitative assessment of impacts and the uncertainty levels around this impact • Conditional on data availability, impacts on different outcomes can be estimated • Able to capture heterogeneity of effects • Able to spatially disaggregate effects	• Typically, they are not so well-suited to explaining the processes and reasons why we observe the estimated impact • Cannot estimate the impacts of policies that have not yet been observed • Difficulties in handling combinations of policies/interventions • Does not capture economywide effects	Magrini and Vigani (2016) estimated the impact of adopting improved maize seed and fertilizer on several food security indicators, including yields, food expenditure, dietary diversity, and vulnerability. The authors found heterogeneous effects across dimensions of food security and the types of analyzed interventions. Similarly, Midingoyi et al. (2018) estimated the impact of adopting Integrated Pest Management practices on productivity, income, health, and the environment, the latter using an environmental impact quotient.

			MacPherson and Sterck (2021) found that agricultural investment in a development model in a Kenyan refugee camp positively affected nutrition, well-being, and independence from aid.
Qualitative	• Allows a better understanding of processes • Considers opinions of key stakeholders/experts • Can highlight unintended or unobserved consequences of policies and potential trade-offs	• Unable to quantify the impact of a policy/intervention • Unable to quantitatively simulate the effects on various outcomes	Barca et al. (2015) evaluated cash transfer programs across six countries using qualitative methods—mainly focus group discussions and key informant interviews—across a large set of outcomes. While no quantitative impacts could be obtained, the analysis provided rich insights into several outcomes. For the links between cash transfers and productive investments by households, transfers can encourage productive investments in income-generating activities. However, this was mostly the case for slightly better-off households. Many poorer households rely on cash transfers for their daily needs. Shinyekwa et al. (2023) used focus group discussions and key informant interviews to understand farmers' and sector experts' perceptions of pressing commodity-specific investment needs across districts in Uganda.

4.2. SIMULATION-BASED MODELING METHODS

Policymakers often require evidence before deciding on which policy to focus on. Of course, if available, policymakers can always rely on meta-analyses[35] of the effects of a given policy/intervention in other settings and infer the potential impact in the context of interest. However, such analyses may not be available or not directly applicable to the national setting. This is particularly true of the repurposing agricultural policy support options, as the optimal set of policies might differ given the country's context and objectives.

To analyze policies' potential impact before implementation, practitioners often rely on simulation models such as microsimulation approaches, general equilibrium models, partial equilibrium models, or a combination thereof.

Microsimulations are an important tool when quantifying a policy's potential impact on a given outcome. They are used widely to analyze the distributional impacts of fiscal policies. There are many different types of microsimulation tools. However, the main idea behind the modeling approach is that a response to a given shock is modeled using mathematical models or by estimating the relationship econometrically based on previous data. Based on the modeled relationship, an impact can be predicted for each household based on its characteristics. Analysts can then use the differences in the outcomes with and without the shock to analyze the average change and the change in the distribution of specific variables.

Microsimulations are widely used in policy to evaluate the potential impacts of fiscal policies, i.e., taxes and subsidies. Microsimulations have been widely used in agriculture. For example, Chyzheuskaya et al. (2014) estimated the impact of nitrogen mitigation measures on-farm income in Ireland. EU directives introduced in the year 2000 aimed to improve water quality by 2015; one proposed way to achieve that is by reducing the amount of nitrogen used on farms, which then enters the water streams. Chyzheuskaya et al. simulated the potential impacts of reducing nitrogen use on farms and found this would likely reduce farm income, showcasing a trade-off between environmental and economic outcomes.

A different modeling approach is based on mathematical representations of the sector/economy. Two main types of widely used models exist: partial and general equilibrium. Partial equilibrium models typically focus only on one sector, e.g., the agricultural sector. The main idea behind partial equilibrium models is that—based on a mathematical representation of the sector, including demand and supply curves for all crops—the modeler can simulate how a set of outcomes would change following a shock. Partial equilibrium models have been widely used in policy to model the supply and demand of world agriculture (FAO-OECD 2022). They have also been used to assess, for example, the effects of tariffs (Balié et al. 2021) or the effect of productivity increases on prices, which are used to simulate the impacts of investments in research on household income and poverty reduction (Minot et al. 2021).

However, one of the drawbacks of partial equilibrium models is that they ignore the linkages between sectors.[36] This is a valid concern given the agriculture sector's many backward and forward linkages and its large economic share, specifically in developing countries. Therefore, any shocks impacting it will likely significantly affect factors like wages, labor demand, and food prices. The consequences of these shocks could extend far beyond the agricultural sector.

[35] Meta-analysis is an analysis of the results of multiple studies. They are useful to have a summary of the imapcts of a certain intervention/policy and understand why the effects differ in different contexts based on different features.
[36] Although there are arguments for preferring partial equilibrium models, see Winters (1990).

In recent years, CGE models have been used extensively to simulate the impacts of a wide-ranging set of trade and market policies and public expenditures. We discuss three economywide model types here and focus mostly on expenditures such as fiscal transfers and subsidies, as they are the most relevant instruments in the repurposing agenda. However, while our discussion focuses predominantly on public expenditures, most of these models can also incorporate other instruments, such as changes in trade policy. While models differ, they all focus on simulating the impacts of different policies and expenditures on several agricultural transformation outcomes, including employment, agricultural GDP, and poverty.

One extensively-used model is IFPRI's Rural Investment and Policy Analysis model, which focuses on ranking the simulated impacts of different crop-specific investments on different outcomes at the country level. In this model, as explained by El-Kersch et al. (2022), the monetary values of crop-specific support, such as fertilizer subsidies or investments in irrigation, are first converted into units, such as the number of farmers who receive fertilizer. The next step is to determine the productivity impact of this additional expenditure. The productivity shock arising from this additional expenditure is then used as a shock in the model, simulating the impact on different outcomes. If invested amounts are kept constant across commodities, analysts can then rank the cost-effectiveness of investments.

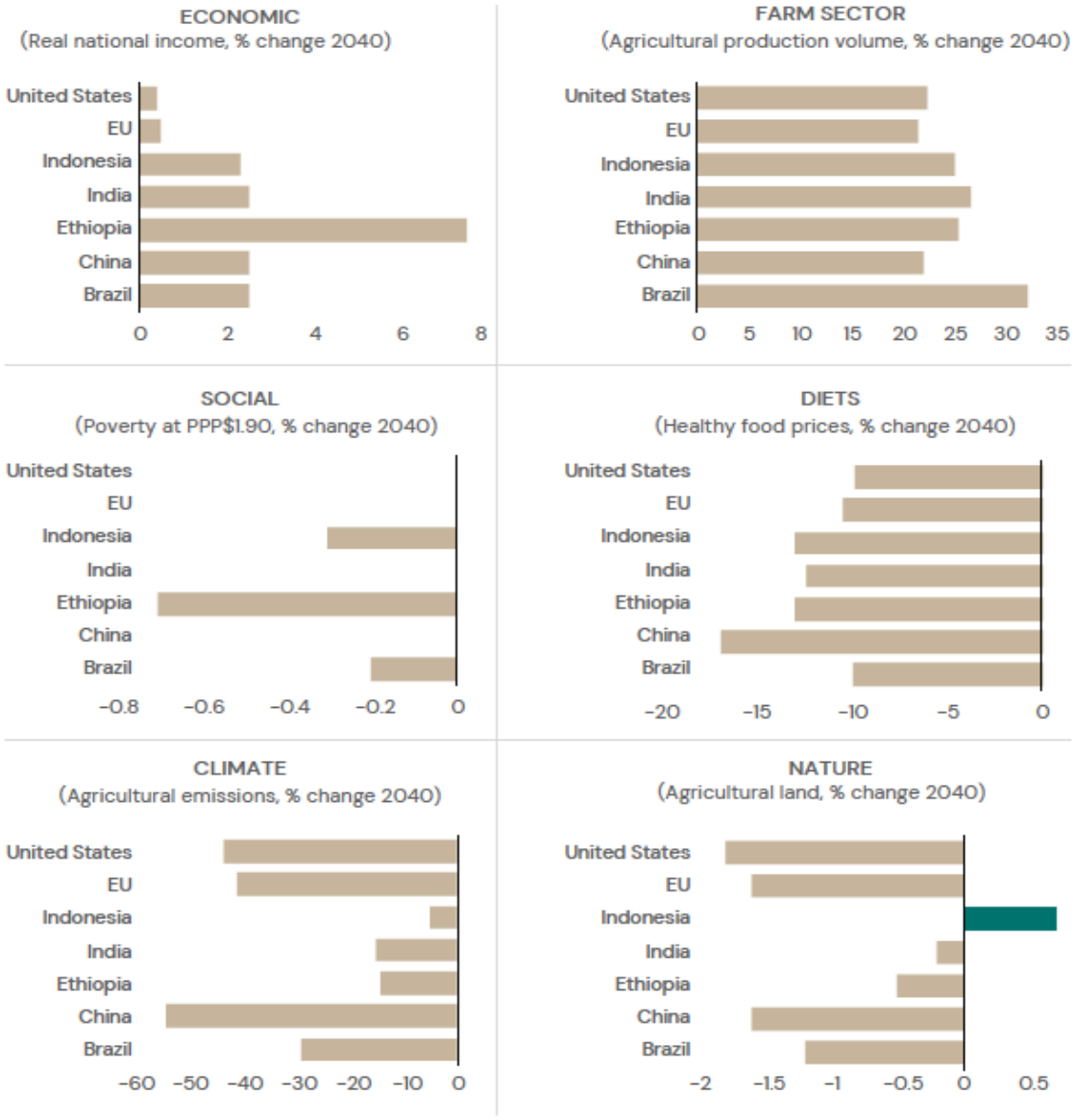
Another exercise pursued in several countries is to use modeling tools to produce a ranking of commodities and their sectors at the country level. The underlying idea is that, by doing so, modeling can inform policymakers of the sectors where productivity increases can have the highest impact on agricultural transformation outcomes. Such an approach has been used in Uganda and Mexico (Sánchez et al. 2022). However, there have been criticisms of such type of models. One criticism is that, while they provide a ranking of sectors and allow the modeler to test alternative expenditure scenarios, they do not provide an optimal crop-specific and investment-specific composition of investments. These absent findings could be very useful for planners in developing countries' agricultural and finance ministries.

Sánchez and Cicowiez (2022a) developed a country-specific policy optimization approach for modeling that is commodity-specific and considers expenditure composition. The approach developed by Sánchez and Cicowiez (2022a) has the advantage of providing a unique, theoretically optimal solution (commodity and expenditure composition) that is as close as possible to the multiple objectives of the policymakers.[37] Such an approach can be particularly useful for ministries of agriculture and ministries of finance as it embeds financial constraints (source of financing, total investments) and provides evidence of the trade-offs policymakers may face. For instance, in Ethiopia, Sánchez and Cicowiez (2022b) found that the optimal composition for cheaper healthy diets may differ greatly from the one optimal for achieving agrifood GDP growth. Importantly, given the flexibility of the modeling approach, it can be extended to include a wide range of policy instruments and outcomes. However, as it stands, this approach still focuses very much on agricultural and related outcomes and has a very strong focus on agricultural policies.

Finally, Gautam et al. (2022) used IFPRI's global general equilibrium model, MIRAGRODEP, to assess the impact of repurposing agricultural subsidies at the country level in Brazil, China, Ethiopia, India, Indonesia, the United States, and for the EU as a whole. As shown in Figure 4.2 below, they found that repurposing agricultural support would help to achieve multiple development goals in each of the countries/regions. These include increasing agricultural production and income, reducing poverty, increasing the price of healthy diets, and reducing agricultural emissions. In all cases except Indonesia, it would reduce cropland use.

[37] The model also allows weights to be assigned to different objectives, to account for the fact that some objectives may be more important than others.

Figure 4.2: Impacts of Country-Specific Repurposing Scenarios



Source: Authors using model simulation results.
Note: ***Brown bars*** indicate movement toward, and ***teal bars*** indicate movement away from achieving the related SDG(s).

Source: Gautam et al. 2022.

4.3. ECONOMETRIC METHODS

The concept of value for money has become increasingly important in international development in recent decades. As a result, this was also accompanied by a noticeable increase in the use of robust quantitative evaluation methods to quantify the measurable impacts of a given intervention or policy. Methods for impact evaluation may be experimental or non-experimental. Econometric methods include both structural models that can provide a framework for ex-ante analysis and RCTs that focus on reduced forms. These methods all attempt to identify the impact on an outcome of interest. To do this, all methods, based on a set of assumptions, rely on the concept of a counterfactual, which provides a value (estimated or observed) of the outcome (or potential outcome) in the absence of the treatment.[38] Given the scope of the module/section, we provide an overview of these methods and refer the reader to Glewwe and Todd (2022) and Todd and Wolpin (2023) for a comprehensive review.

4.3.1. Randomized Control Trials

In recent years, Randomized Control Trials (RCTs) have become the golden standard of ex-post evaluation methods.[39] RCTs' underlying idea is that if two groups—a treatment group and a control group—are randomly drawn from the population before the treatment is administered, then, on average and under certain assumptions, this essentially eliminates the possibility that selected households are treated due to observed or unobserved characteristics. Observed characteristics include age or income, while unobserved characteristics include political connections or skills. As a result, the observed differences in the mean of the outcomes between control and treated groups (after administering treatment) are caused exclusively by the treatment rather than by differences in uncontrolled household characteristics. One example of an RCT in agriculture is Aker and Jack (2021), who found that knowledge, rather than credit, seems to be the main barrier to adopting environmental technologies in agriculture in the Sahel. However, while the method is probably considered the most robust, it is also very data-intensive and inevitably requires many resources to design and implement.[40] As a result, RCTs can often take several years to provide results. RCTs are also best suited for treatments where it is possible to administer separate treatments to different sampling units.

For several reasons, RCTs are often not the most fit-for-purpose method for analyzing government policies. First, using RCTs implies that the policy/intervention has not yet happened and precludes the analysis of past interventions. Second, in some cases, such as import tariffs, policies affect everyone in multiple groups, e.g., all producers and all consumers, in different ways and simultaneously. Third, in some cases, RCTs may not be implementable for ethical reasons, i.e., it would be unethical to distribute food aid to some but not all undernourished people. Fourth, they may not have external validity, with a policy's success in one sample not equating to success for the larger population or in a different setting. Finally, in some cases, policymakers are more interested in understanding the effects of small changes to a strategy composed of a complex set of policy instruments. In such cases, assessing this using an RCT would be very challenging.

[38] In the context of this module, the treatment can be a programme, intervention, or a given policy of interest.

[39] Interested readers are invited to read Deaton (2010), Deaton and Cartwright (2018), and Pearl (2018) for a comprehensive review of the issues surrounding randomized control trials (RCTs).

[40] There is a need to draw a random sample, conduct a baseline sample, ensure that the random draw worked (on observables), administer the treatment, wait for the treatment to take effect, collect the follow-up survey data, and then analyze the results.

Given RCTs' limitations, practitioners most often use non-experimental methods, data permitting[41]. This module focuses on four widely used types of methods: matching, difference in differences, regression discontinuity, and instrumental variable/Control function methods[42].

For matching methods, the main underlying idea is that, under certain assumptions, if we can match a treated unit (e.g., someone who received fertilizer) with one or more theoretically equivalent untreated units (people who did not receive fertilizer), then the observed difference in outcomes would be as good as random. As such, it can be interpreted as a treatment effect. The most commonly used matching method is called propensity score matching (PSM) (Rosenbaum and Rubin 1983). The idea behind this estimator is that if we have two (or more) individuals—one treated and one or more untreated—that are theoretically similar based on certain important observable characteristics, then they can be matched. In practice, the probability of adoption, i.e., the propensity score, is calculated for every treated or untreated unit based on a set of observable characteristics. Then, treated units are matched with control units with similar propensity scores. The observed difference in outcomes is then averaged over all matches to get a treatment effect. This method has been used extensively in the literature. For example, Mendola (2007) used PSM and found that the adoption of high-yielding varieties of rice greatly affected farmers' income and poverty reduction. In terms of data requirements, it is less onerous than running an RCT. We can estimate an impact as long as cross-sectional data (i.e., one year of data) for a large enough number of households is available and contains a rich set of covariates, the treatment status, and the outcome of interest. Thus, PSM provides a powerful tool that is relatively simple and cost-effective.

However, PSM has several drawbacks. First, it only controls for selection on observables, meaning we cannot generally rule out that the estimated impact may be driven by unobservable characteristics, e.g., motivation or skill, rather than the intervention itself.[43] A second potential issue is that it is possible that in certain samples, for certain parts of the propensity score, there are units that cannot be matched as there are no theoretically equivalent observations in the sample. This issue is often referred to as common support. A third potential issue of matching methods, highlighted by Iacus et al. (2012), is that, in some cases, especially when there are many covariates and the treated and control groups are similar to start with, matching methods can actually increase the overall imbalance in the covariates. Iacus et al. (2012) propose using Coarsened Exact Matching to ensure that units are equivalent in terms of all observables rather than their overall propensity score. Despite these concerns, matching methods remain widely used because they remain easy to implement, and the data requirements to implement them are not too onerous.

4.3.2. Differences-in-Differences

A second widely used method is the differences-in-differences estimator and its extensions. In some cases, we may have access to a panel dataset, i.e., where the same units are observed over multiple periods. Some of the units in the database may receive the treatment at some point in the observed period.[44] In these cases, if the treated and non-treated units exhibit similar behavior pre-treatment, known as having parallel trends, then any differences observed after treatment in the two groups' trends are essentially an estimate of the impact. This estimate accounts for unobservable time-invariant factors but not time-variant ones. To run this method, a practitioner must have access to

[41] In this note, we will focus on methods that look at the impacts on the mean and, as such, will not look at methods such as quantile regressions that are interested in looking at the changes in distributions.

[42] Other methods include, among others, endogenous switching regressions and interrupted time-series analysis. These will be left out. While these methods are useful and clearly serve a purpose, they are less often used.

[43] To address this, uses of alternative methods, such as IPWRA, which is doubly robust, has been proposed. It does not eliminate unobserved bias, but makes it less likely that it will happen. A second option is to compute the size of the unobservable bias that would invalidate the results and assess whether an unobservable this big is plausible or not (Rosenbaum 2002; Ichino et al. 2008).

[44] The method works as long as treatment is not received in the first period.

panel data, and the units must behave similarly pre-treatment, i.e., parallel trends are assumed.[45] Sometimes, this assumption may not be supported or tested in the data. In cases where the parallel trends assumption does not hold or if a practitioner wishes to estimate the impact and has access to a longer panel with sufficiently long pre- and post-treatment periods, an alternative is to use synthetic control.

Synthetic control matches a treated unit to a linear combination of untreated units closely resembling the treated unit.[46] Any observed differences between the treatment unit and its synthetic counterfactual after the policy or event intervention can be interpreted as the treatment effect. Two placebo tests are generally conducted to ensure that the results are not due to luck. The first test assumes the treatment occurred before the true date (i.e., a placebo in time).[47] The second test runs the method over every set of controls and then compares the estimated treatment impact for the control units to the one estimated for the treated unit. The expectation is that the estimated treatment impact for the treated unit will be higher than for non-treated units. Andersson (2019) provides an example of an application of synthetic control; Andersson found a strong effect of carbon taxes on CO_2 emissions in Sweden. Similarly, Sills et al. (2015) found that a local policy initiative to reduce deforestation in Paragominas, Brazil, had no immediate impact. However, that evidence suggested a lagged impact, with outcomes becoming significantly different from the synthetic results four years after treatment.

4.3.3. Regression Discontinuity

Regression discontinuity is a third increasingly common method, which can provide a robust identification strategy. This method relies on an exogenously set threshold to assign treatment, e.g., people with a certain income level or age. The key concept is that looking at the difference in outcomes just before and after the threshold can estimate a treatment impact. If people cannot manipulate their treatment status, the treatment outcome can be considered locally randomized. Assuming certain conditions are met, if there is a jump in the outcome of interest at the threshold, this can be considered an impact. The underlying idea is that units marginally below and above the threshold are unlikely to differ in treatment status. Generally, only cross-sectional data, information on covariates, and knowledge of the threshold are required to implement this method and understand whether it was consistently applied throughout. In a recent application of a regression discontinuity design, it was discovered that investing in a development model, specifically through agriculture, in a refugee camp in Kenya positively affected nutrition, well-being, and independence from aid (MacPherson & Sterck 2021).

4.3.4. Instrumental Variables

The last method we review is the instrumental variable (IV) approach. This approach's underlying idea is that the coefficient can be biased when we estimate a simple ordinary least squares regression. In simple terms, the estimated coefficient may capture unobservable characteristics of the observation unit rather than the true coefficient associated with the intervention/policy.

The IV approach addresses the issue of endogeneity by using a variable that highly correlates with the treatment but is uncorrelated with the outcome of interest. Essentially, this variable should only affect the outcome through its effect on the treatment's probability. By using this variable as an instrument,

[45] Note that it is also possible to test parallel trends if there is only one period pre-treatment, as long as there are at least two periods post-treatment. In these cases, a common shock is assumed across all three periods and the difference between the final observed outcome and the outcome under a common shock is the impact.
[46] Weights are chosen to minimize the pre-treatment differences in outcomes.
[47] Here we would expect no impact as if treatment is assumed for a period before the treatment of interest, we would expect a null impact.

a practitioner can estimate an unbiased impact of the treatment. The advantages of the IV approach include its simplicity, ability to use most standard statistical packages, and the fact that it only requires cross-sectional data. However, finding a convincing instrument that meets the necessary correlation and uncorrelation requirements can be challenging in practice. Tests involving multiple instruments, control functions, or placebo effects can help test these assumptions, but they only provide reassuring indicative tests, not proof beyond doubt. Despite these limitations, the IV approach is still popular and widely used in economics. For instance, Weber and Key (2012) used the IV approach and found that decoupled payments in the United States had little effect on aggregate production.

Table 4.2 summarizes the strengths and limitations of the aforementioned econometric methods. However, it is important to note that these econometric methods require available data and typically focus on ex-post evaluations. This seriously limits their use for assessing the potential impacts of policies that have not yet been observed, although past impacts or meta-analyzes can indicate likely impacts. Furthermore, these methods usually focus on analyzing the impacts of a single treatment on a single outcome. However, they can be applied to multiple outcomes, assuming the necessary data is available. It is worth noting that combinations of treatments can also be treated as a single treatment, but this can lead to sample size issues. While econometric methods can estimate the impacts, they often do not provide insights into how the effects of a shock propagate through the economy. Simulation approaches are typically used to answer these questions and are covered in the next subsection.

Table 4.2: Summary of Strengths and Limitations of Different Econometric Methods for Evaluating Policies

Method	**Strengths**	**Limitations**	**Example(s)**
Randomized control trial	• The gold standard for impact evaluation • Robust • Allows estimation of impacts (causality)	• Data intensive • Requires many resources • Best suited to situations where different treatments may be assigned to different groups • Ethical issues often prevent RCTs • Limited to policies that have not yet been implemented • May lack external validity • Cannot be used to evaluate small changes to a complex strategy composed of multiple interventions	• Adoption (or non-adoption) of environmental technologies in agriculture in the Sahel (Aker & Jack 2021)
Non-experimental methods			
Matching	• Requires only one wave of cross-sectional data • Relatively simple to implement • Quick and cost-effective if data is already available	• Requires a rich set of covariates • Does not consider the potential impact of unobservable factors • Evaluating complex interventions (e.g., combinations of interventions) can lead to small samples of treated/untreated units • Limited to policies that have already been implemented and for which there is data	The poverty impact of high-yielding rice varieties on poverty reduction in Bangladesh (Mendola 2007) Impact of improved maize seed and fertilizer use on different dimensions of food security in Tanzania (Magrini and Vigani 2016)

Difference in differences	Considers time-invariant unobservable characteristics of the treatment units Relatively simple to implement, quick, and cost-effective if data is already available	• Requires panel data spanning several years, typically at least two periods pre-intervention and one period post-intervention • Treated and untreated units must behave similarly pre-treatment • Limited to policies that have already been implemented and for which there is data	Evaluating the impact of farmer-to-farmer extension in Tanzania (Nakano et al. 2018) Effect of carbon taxes on CO_2 emissions in Sweden (Andersson 2019), using a synthetic control Impact of local policy initiative to reduce deforestation in Paragominas (Sills et al. 2015)
Regression discontinuity	• Very robust impact evaluation design as treatment generally "as good as random" in the vicinity of the threshold • Relatively simple to implement, quick, and cost-effective if data is already available	• Application is limited to cases where thresholds for treatment assignment are exogenously determined. This severely restricts the wide application of this method for repurposing • Only works if the threshold is not contaminated by other treatments that share the same threshold for assignment • Limited to policies that have already been implemented and for which there is data	Shifting from a humanitarian to a developmental model of assistance to refugees (MacPherson and Sterck 2021)
Instrumental variable/ control function	• Robust impact evaluation technique • If a valid instrument is readily available, it is relatively simple to implement, quick, and cost-effective if data is already available	• Challenging to find a valid instrument. In most cases, it is impossible to prove beyond doubt that the instrument satisfies all the necessary conditions, although some falsification tests can provide supporting evidence • Challenging to handle multiple treatments simultaneously • Limited to policies that have already been implemented and for which there is data	Impact of decoupled payments on production in the United States (Weber and Key 2012)

4.4. QUALITATIVE METHODS

Qualitative methods can be used on their own or combined with quantitative methods to assess policy interventions in a quicker and potentially cheaper way. While quantitative methods typically focus on quantifying the impacts of interventions, they may not always be suitable. First, quantitative methods are often limited in their ability to explain the results and may not capture the complexity of the events. For example, there are cases where phenomena or interventions are too costly, unethical, or too complex for quantitative methods (DeJaeghere 2022). Qualitative analyses can provide more in-depth insights into why and how impacts occurred and identify any unintended effects of policies that may not be captured in quantitative analyses, as the effect was not even considered. This focuses on two widely used methods for collecting qualitative data: open-ended interviews and textual analysis (DeJaeghere 2022).

DeJaeghere (2022) proposed that open-ended interviews are perhaps the most common way of collecting qualitative data. In this way, interviews and discussions with different participants or groups, including key informants and focus groups, can help analyze specific questions. Doing so can

shed light on their perceptions, experiences, and feelings, illuminating the key outcomes and aspects of the studied intervention. This type of method is generally much cheaper than quantitative methods and generates results much quicker, but generally cannot provide a robust quantitative assessment of an intervention's effects. Shinyiekwa et al. (2023) used focus group discussions with farmers and key value chain stakeholders to understand the perceived critical investments and interventions needed to improve value chain performance for selected commodities and districts. Of course, the analysis cannot quantify the potential impact of each intervention, but it can elicit a ranking of perceived needs from farmers. For example, stakeholders may view seeds as the most critical investment for the selected crops in some districts.

Qualitative methods such as textual analysis can provide a more in-depth understanding of the phenomenon of interest. Textual analyses can be used to analyze discourse and better understand differences in beliefs relating to policies. For example, Mockshell and Birner (2020) used discourse analysis to explore how differing beliefs about policies between donors and national stakeholders in agriculture may significantly influence the lack of progress toward consensus on the most effective agricultural policies.

4.5 THE NECESSITY FOR MULTIPLE METHODS

Agricultural policy aims to achieve multiple objectives, such as increasing production, making it more environmentally sustainable, reducing poverty and food insecurity, and promoting healthier diets. However, simulating the impacts of policies on all these dimensions is challenging. A key reason is that policies may affect different dimensions in different ways, requiring complex bundles of policies. The problem's complexity requires that the chosen model consider multiple objectives and instruments, but that alone is insufficient. To produce credible evidence, a model must consider multiple objectives and instruments and satisfy three conditions: it must model trade-offs among various objectives, understand policy constraints, and include robust evidence on the impacts of individual policies. Since no single method is likely to achieve this, multiple methods are needed to produce credible results.

The initial aspect involves comprehending trade-offs and multiple instruments. Any approach that can precisely evaluate the effects of policy bundles on various outcomes must necessarily consider and, ideally, quantify the synergies and trade-offs involved. Synergies and trade-offs are key for policymakers implementing policies. In this regard, approaches such as CGE models hold promise for both national and global analyses. For more information, see Sánchez and Cicowiez (2022a), Springmann and Freund (2022), the FAO, UNDP, and UNEP (2021), and Gautam et al. (2022).

Early evidence suggests that trade-offs can be significant in some cases. For instance, Sánchez and Cicowiez (2022b) found that trade-offs between poverty reduction and increasing value added from agriculture are minimal in Ethiopia. However, trade-offs are larger when considering the affordability of healthy diets. A similar argument can be made for the environment, where the intensive use of agricultural inputs can boost production but is also likely to have adverse environmental consequences.

Economywide models are the most appropriate tools to handle complex simulations focusing on the effects of multiple policies on multiple outcomes. Nevertheless, other approaches are needed to complement these models and make them more realistic.

Ex-post econometric methods also play an important role. As the number of impact evaluations on the effectiveness of various interventions across different outcomes increases, these methods will be a useful source of evidence and likely improve the accuracy of economywide approaches. Economywide models must use the best available parameters to conduct their simulations, as the models are only as good as their underlying parameters. Since policies and investments have differing impacts across countries and dimensions, it is critical to invest time and resources in creating a body

of evidence that modeling work can draw upon. Achieving this, however, will likely require collaboration across different fields to estimate such parameters.

Qualitative methods are also important in scenario design, informing modelers about what is politically and fiscally viable and ensuring that simulated policies align with country-specific trade agreements and policy commitments. Failing to embed some political realities in the modeling work may lead to fascinating but ultimately unimplementable results. Another key area where qualitative methods can contribute is assisting in defining the trade-offs that policymakers are willing or unwilling to make, as policymakers in different countries are unlikely to have equal preferences across the various dimensions of the repurposing agenda.

MODULE 5: TOOLS TO UNDERSTAND THE POLITICAL ECONOMY OF REPURPOSING AGRICULTURAL POLICIES

Repurposing agrifood policies entails redistributing access to resources, with winners and losers, which has political redistribution effects. That is, groups and organizations that increase their access to resources also consolidate their power relative to other groups and, thereby, their ability to claim additional resources.[48] Stakeholders with economic and political interests associated with repurposing will push, block, or be neutral to repurposing reforms based on how these changes affect their perceived interests in redistribution.

This module introduces the political economy of reforms. It highlights some of the approaches used to understand who the stakeholders are, their perceived interests, and their capacity to push or block the change. This knowledge helps in understanding how to drive reform by engaging with the right players at the right time and with the right messaging. Policy practitioners incorporate these considerations into their routine work of informing, designing, or implementing evidence-based policy change. Formalized approaches also support this "thinking and working politically" (Booth 2011), often called Political Economy Analysis.

5.1. CONCEPTUAL APPROACHES TO POLITICAL ECONOMY ANALYSIS

5.1.1. What is Political Economy Analysis?

Political economy analysis is built on a set of analytical methods aimed at better understanding the political determinants and consequences of economic policy, i.e., how the distribution of power, incentives, and interests interplays with the allocation of scarce resources. Political economy analysis methods can be found in a rich literature of toolkits aimed at policy analysts and practitioners (DFID, 2009; Fritz, Kaiser, & Levy 2009; Hudson & Leftwich 2014; Hudson, Marquette, & Waldock 2016; Moncrieffe & Luttrell 2005; Unsworth & Williams 2011).[49] In addition, the literature on economics, political science, and policy studies offers a wealth of relevant concepts and approaches that feed into political economy analysis methods.

The section below presents three common frameworks: the Advocacy Coalition Framework, the Multiple Streams Framework, and the Kaleidoscope Model. However, this is not a definitive list of frameworks that should be used. The objective is to introduce some of the approaches that capture key elements of political economy analyses and can be used to inform the repurposing of agricultural support.

[48] A useful definition of this organizational power is provided by Mushtaq Khan: "the capacity of an organisation to hold out in actual or potential conflicts against another organisation or the State" (Khan 2010); such capacity is itself a function of the organisation's ability to impose costs on others and absorb damage inflicted. In developing economies, the main source of power is not economic capabilities but organisational power, that is the success in ''organizing factions (…) that can be deployed in political mobilizations" (Khan 2010) and the ability to ''mobilize and enthuse and (…) identify and reward the right people through formal or informal networks" (Khan 2017).

[49] Political economy analysis differs from the political economy academic literature in that it is specifically designed to support actionable analysis for policy practitioners. Analysis methods are often designed by and aimed for multilateral and bilateral development agencies, and are meant to be carried out at country level (Hudson & Leftwich 2014). The academic political economic literature is divided into several schools of thought, including classical, neo-classical, institutionalist, neo-institutionalist, Marxist, and feminist.

5.1.2. The Advocacy Coalition Framework

The Advocacy Coalition Framework (ACF), developed by Sabatier and Jenkins-Smith (1993), is especially useful for understanding the role of evidence in policy reforms. The ACF focuses on identifying and analyzing coalitions of actors that share a common policy position (Figure 5.1). These coalitions may involve members of government agencies, civil society organizations, researchers, and others.

Advocacy coalitions operate within a policy subsystem, such as agricultural or food policy. They engage in coordinated action on a salient policy issue over an extended period. The ability of these coalitions to shape the policy process depends on the resources they can mobilize. The ACF also acknowledges the role of "policy brokers" who are not part of any advocacy coalitions but may bring them together for negotiations (see Weible, Sabatier, and Mcqueen 2009).

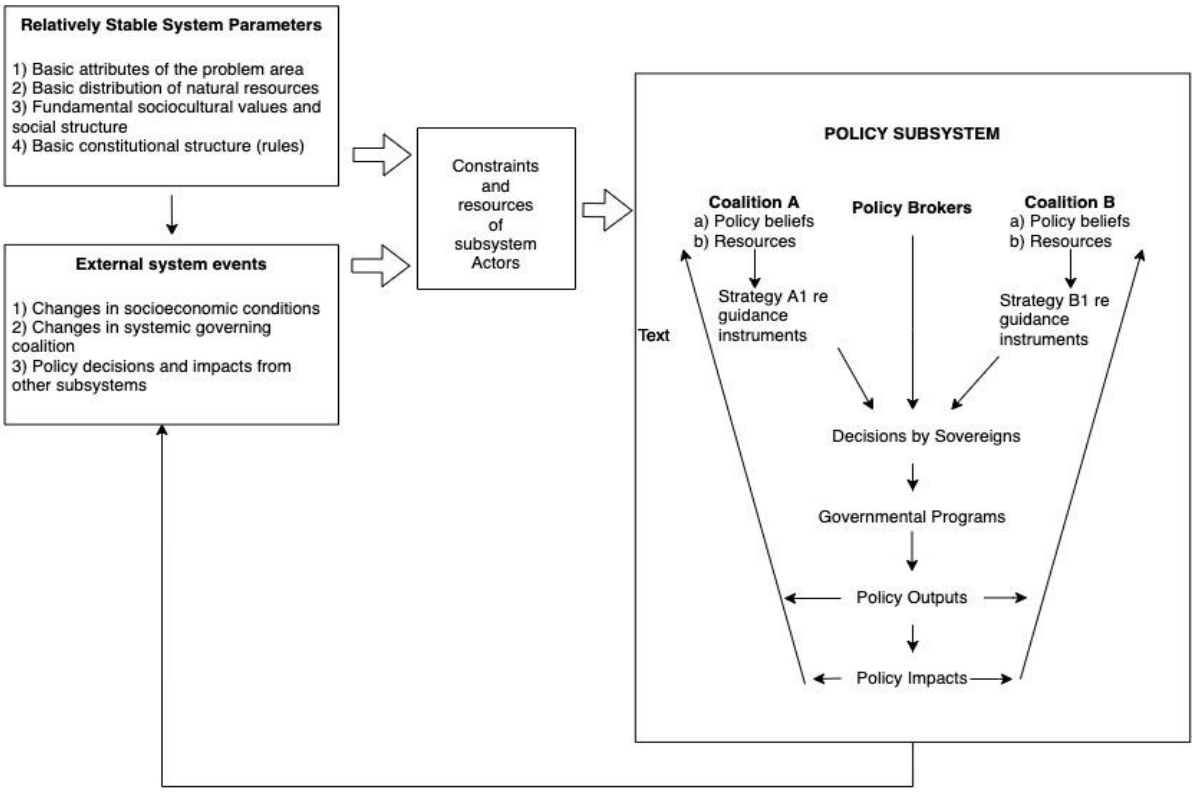
Advocacy coalitions share similar policy beliefs. The ACF distinguishes between three types of beliefs.

- *Deep core beliefs* are entrenched, often normative, and difficult to update. They refer, for example, to views on the role of the state versus the market in organizing society.
- *Policy core beliefs* are more moderate in scope and refer to a specific policy subsystem. They often form the basis for the formation of advocacy coalitions. They can include, for instance, beliefs on the usefulness of input subsidies as a policy instrument.
- *Secondary beliefs* are narrower in scope, more empirically based, and likely to change over time. Following the example above, they may relate to e-vouchers' ability to limit subsidy leakages.

According to the ACF, policy change can happen along different pathways. One pathway is called "policy-oriented learning," defined as a change in thinking or behavioral intentions within advocacy coalitions resulting from experience and/or new information. Other reasons for policy change include external shocks and events within the policy subsystem.

These changes are mediated or negotiated through agreements between advocacy coalitions. One important insight from the ACF is that advocacy coalitions often use research-based evidence strategically and selectively. Another insight is that *how* research-based evidence is presented matters when aiming to promote policy-based learning across advocacy coalitions and achieve policy change.

Figure 5.1: The ACF



Source: Sabatier 1988.

Birner and Resnick (2010) developed an extended version of the ACF (see Box 5.1). This framework considers that the actions of advocacy coalitions are characterized not only by similar policy beliefs and resources but also by compatible economic and political interests. The extended ACF considers that advocacy coalitions can use different strategies to convert their resources—economic, human, and social capital—into "political capital," defined as resources that political actors can use to pursue their interests. For instance, advocacy coalitions with high social capital in the form of large membership networks may leverage it as votes to earn political capital. On the other hand, coalitions with social capital characterized by concentrated but high-level membership can use lobbying to convert it into political capital.

Box 5.1: Why is Subsidy Policy Reform So Difficult? Insights from an Advocacy Coalition Framework Case Study of Electricity Subsidies for Groundwater Irrigation in India

Groundwater depletion due to irrigation is a major problem in India, posing a threat to food security and the environment, as groundwater provides 60 percent of India's irrigation water supply. In most states of India, electricity for pumping groundwater is provided at a flat rate or even free of charge, so farmers have no economic incentive to save either electricity or groundwater. A common criticism is that large farmers benefit more from the flat rate subsidies than smallholders. Charging farmers by the volume of electricity they use, thus providing incentives to save groundwater and electricity, is a decades-old suggestion. Despite compelling reasons for subsidy reform, however, only three Indian states had done so in 2006.

Using the extended version of the ACF, Birner (2011) identifies two advocacy coalitions orbiting around the groundwater electricity subsidy reform. The first, the market-oriented coalition, brings together donors, international financial institutions, politicians at the central level, some academics, and a national-level farmers' organization. This coalition argues in favor of abolishing distortive and inefficient subsidies or, as a second-best, targeting them. In contrast, the welfare state-centered coalition comprises regional-level farmer organizations, politicians, and academics. It argues against subsidy removal, presenting them as an instrument to relieve "agrarian distress" and rejecting the premise that they lead to the overuse of groundwater due to electricity rationing. The coalitions clash in their core beliefs regarding the role of the state and the market and have negative views about the other coalition (Table 5.1). Therefore, the debate about the subsidy is deeply rooted in worldviews rather than being a mere technical issue amenable to a purely evidence-informed discussion.

Table 5.1. Narratives of the Two Discourse Coalitions

	Market-Centered Coalition	Welfare State-Centered Coalition
Stakeholders	Donors; World Bank; central level politicians; Liberal Farmers Movement; academics	State-level farmer organizations; state-level politicians; environmental NGOs; academics
Framing of the problem	Market distortions; efficiency loss	Agrarian crisis/distress; farmers' suicides
Perceptions about subsidies	Core element in a vicious cycle (low quality/low revenues)	Important policy instrument to address agrarian distress
Groundwater depletion	Free electricity/flat rate is a major factor	Due to rationing of supply, not the major factor
Targeting	If subsidies are used, they should be targeted	Targeting leads to the exclusion of the poor in India
Self-image	Defendants of the public good, well-managed economy	Defendants of the poor and the disadvantaged
Other-image	They do not understand the principles of economics They defend the interests of corrupt bureaucracy	They enjoy their own privileges but do not care about the poor They represent the interests of global capital

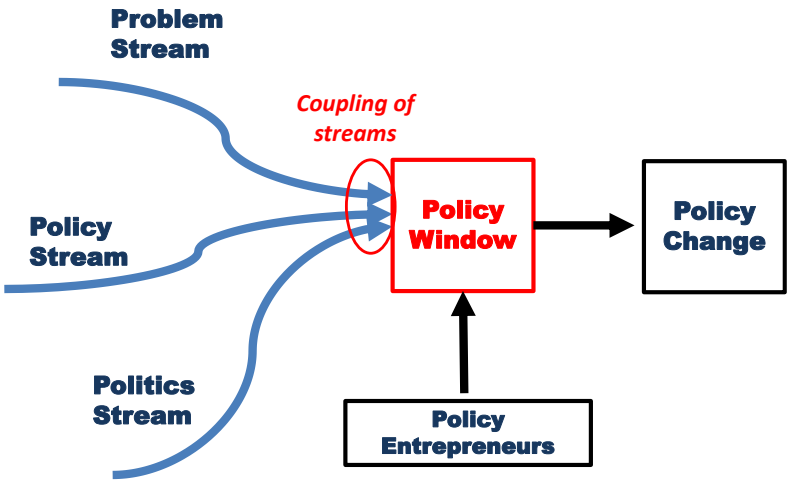
Source: Authors, based on Birner et al. 2011.

According to the authors, evidence providers seeking to shape policy reform should focus on contested facts related to secondary beliefs on which the two coalitions are willing to update their positions. These include, for instance, the impact of the flat rate subsidy on groundwater usage, considering that electricity is rationed, and the effectiveness of targeting input subsidies rather than reducing the rate.

5.3.1. The Multiple Streams Framework

Introduced by Kingdon (1984), the MSF was developed as an alternative to the policy cycle approach (agenda, design, adoption, implementation, evaluation), acknowledging that actual policy processes are messy. It provides a useful heuristic for policy practitioners seeking to assess if conditions are propitious for policy change (Figure 5.2).

Figure 5.2: The MSF



Source: Birner 2021, based on Carney and Jones 2016.

In summary, the MSF considers three conditions, or 'streams', important for policy change (see Box 5.2 for an example). These streams must meet simultaneously to open a window of opportunity for policy change (see review by Cairney and Jones 2016).

The first stream is the *problem stream*. Since policymakers have limited time and resources, they cannot pay attention to all possible problems. However, they are more likely to act if an acute problem escalates. This may happen due to focusing events, such as an acute food shortage. Research-based evidence can also help create problem pressure, e.g., if research findings show a problem is more severe than commonly assumed.

The second stream, the *policy stream*, involves the development of policy solutions over time. If there is no open policy window, these solutions may become redundant. However, the absence of any policy solution means that problem pressure will not result in a policy change. This underscores the significance of research-policy linkages, as the development of potential policy solutions can still be valuable, even if immediate implementation is not assured.

The third stream is the *politics stream,* emphasizing that policymakers must have the motivation and opportunity to turn a possible solution into policy. A change in "national mood" or government often allows policy change. The MSF also recognizes the importance of *policy entrepreneurs,* who can identify policy windows and ensure they are used effectively.

Box 5.2: Using the MSF to Analyze the Introduction of Soda Tax in France

Le Bodo, Etilé, Gagnon, and De Wals (2019) studied the adoption of a 2012 soda tax in France using an MSF analysis to understand how it came about. They identified three key phases.

During 2005–2010 (1), there was a latency phase where concerns about the public health cost of obesity and related diseases began to mount in France (the problem stream). The 2008 financial crisis and the government's adoption of an ''austerity policy'' fueled these concerns, along with statistics indicating an increase in the obese population in France. Members of parliament and commissions proposed a sugar-sweetened beverage (SSB) tax, but the evidence in support of the tax was weak (the policy stream). Also, the political mood was unfavorable due to the 2007 election campaign promises made by the government not to raise further levies (the political stream).

In early 2011, there was a second window of opportunity phase. This window opened unexpectedly following the influential Reyes Report on increasing French agricultural competitiveness. The report recommended that the government reduce the agricultural labor tax and offset the lost revenue by implementing an SSB tax (policy stream). The Prime Minister promptly announced the implementation of an SSB tax. Indeed, the fiscal balance situation had become tense by then (problem stream). However, the country was on the verge of new elections, making it challenging for the government to introduce taxation in politically sensitive sectors. Foreign soda companies were deemed safe enough fiscal targets (political stream).

Thirdly, there was a formulation and adoption phase from September 2011 to January 2012. Most deputies reframed the tax as a fiscal policy instead of a public health instrument to increase its acceptability. While the tax's public health impact could be and was contested, the fact that it raised revenue could not be denied. The food industry fiercely opposed the tax in the initial stages. When it became clear that it would be passed, soda companies re-evaluated their market position. They changed from opposing the tax to advocating that it include non-calorically sweetened beverages (NCSB). They argued that since the tax was not a public health measure, there was also no reason not to tax NCSBs. The government eventually succumbed to pressure and announced a tax for both NCSBs and SSBs at the same rate, thereby negating the public health objective while incurring a greater cost for consumers of NSCBs and SSBs alike.

Source: Authors, based on Le Bodo et al. 2019.

Although it is critiqued as lacking analytical rigor (Cairney & Jones 2016: 1), the MSF has an intuitive appeal combined with great flexibility, making it highly suitable for analyzing policy processes and identifying windows of opportunity for policy reform.

Its application in policy areas related to agriculture has been limited, though some examples exist. Garrelts, Birner, and Wittmer (2005) used the framework to identify windows of opportunity to declare protected areas in Guatemala and East Germany. Faling and Biesbroek (2019) combined this framework with the ACF (see below) and Punctuated Equilibrium Theory[50] to analyze the role of political entrepreneurship in promoting climate-smart agriculture in Kenya. They found that political

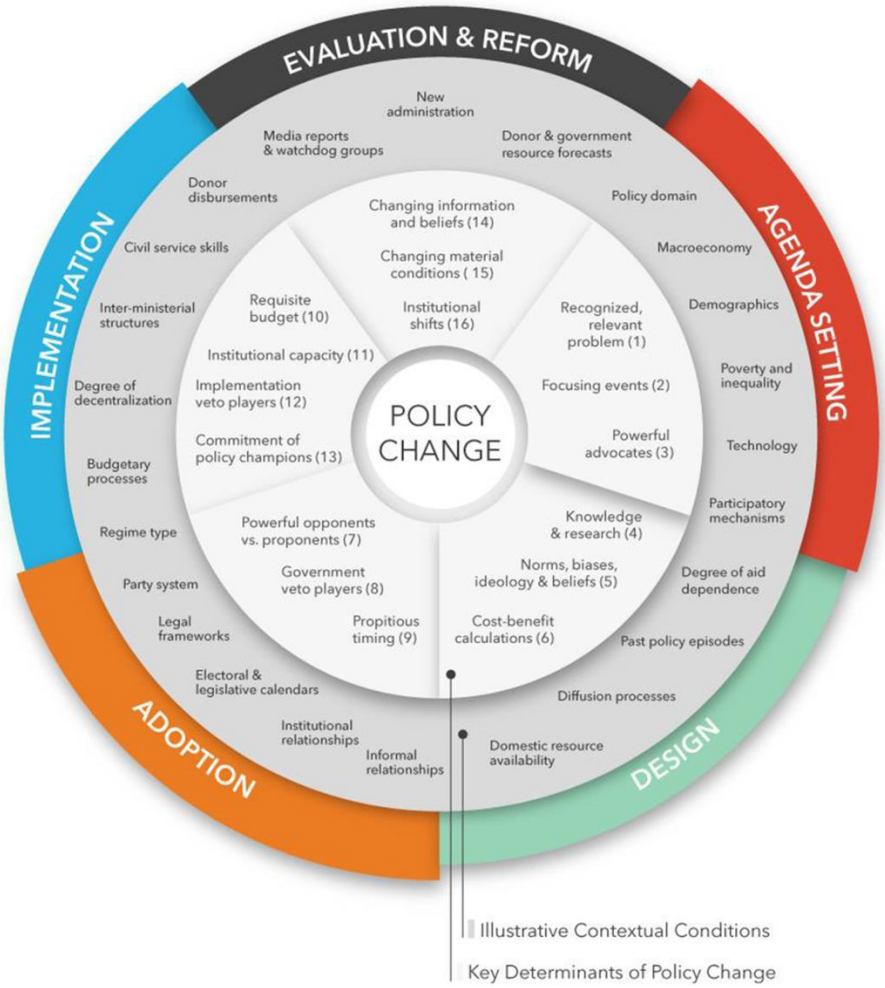
[50] Punctuated Equilibrium Theory originates in biology and "highlights the interaction between a policy monopoly—institutionalized power over political understandings—and interventions by previously uninvolved actors and institutions with new ideas that question and challenge existing monopolies and policies" (Faling & Biesbrock 2019: 529).

entrepreneurs had some influence on the adoption of a national climate-smart agricultural strategy in Kenya. However, the policy window was not large enough to gain support from local authorities.

5.3.2. The Kaleidoscope Model

The Kaleidoscope Model combines elements of different political economy analysis frameworks into a model specifically tailored for food and agriculture policy reform analysis (see Resnick et al. 2015) (Figure 5.3).

Figure 5.3: The Kaleidoscope Model of Policy Change



Source: Resnick and Mason 2016.

The Kaleidoscope Model identifies 16 key determinants of policy change, depicted in the inner circle of Figure 5.3. They are associated with different stages of the policy cycle. For example, in the agenda-setting stage, powerful advocates are identified as crucial, while a requisite budget is a key determinant in the implementation phase. The model also identifies various contextual factors related to each stage of the policy cycle, depicted in the outer circle. While the framework's thoroughness is beneficial, it presents a challenge by offering limited theoretical guidance on identifying crucial variables at each stage of a policy reform. The Kaleidoscope Model has been applied empirically to study the political economy of several food and agriculture policy reforms (Box 5.3).

Box 5.3: Using the Kaleidoscope Model to understand the political economy of input subsidy reform in Zambia

Resnick et al. (2018) applied the Kaleidoscope Model to examine the political economy of input subsidy reform in Zambia. Studying the life span of the 2002 Fertiliser Subsidy Program (FSP) and its evolution into the Farmer Input Subsidy Program (FISP), they utilized the 16 variables (V1 to V16, as indicated in Figure 5.3) outlined in the model to evaluate the driving factors at each stage of the policy cycle: agenda-setting, design, adoption, implementation, and evaluation.

At the **agenda-setting** stage, discussions about the FSP gained momentum after the 2000–2002 Southern African drought. This disaster elevated the issue of agricultural productivity to the top of the agenda (V1 – focusing event), with the recognized problem being the perennial lack of fertilizer used by Zambian farmers (V2). The program garnered support from influential advocates (V3), notably President Levy Mwanawasa. Elected in 2001 amid the drought, Mwanawasa sought to revive fertilizer subsidies to address the problem of low productivity. Additionally, he aimed to mobilize rural support, which had become crucial as urban support for his party was diminishing.

The FSP **design** did not extensively draw on knowledge and research (V4). However, seven years later, when upgraded to the Farmer Input Subsidy Program (FISP), policymakers incorporated significant knowledge and research into the design. In adapting the FISP, policymakers reduced the quantity of distributed inputs to minimize leakages. They introduced targeting criteria based on insights from a World Bank report and a study visit to neighboring countries with more controlled subsidy programs facilitated by Michigan State University. Norms, biases, ideology, and beliefs (V5) emphasizing the government's role over the market in supporting agriculture strongly influenced the subsidy program's design. However, these beliefs were flexible to a shift in cost-benefit calculations (V6). For example, a technological breakthrough enabling farmers to purchase subsidized fertilizer through digital payment prompted policymakers to withdraw the government from the costly distribution stage of the program.

The influence of powerful proponents over opponents (V7) and government veto players (V8) played a significant role in explaining the **adoption** of the subsidy reform and its subsequent modifications. Adopting e-vouchers to mainstream the program seemed logical and received donor support from 2010 to 2013. However, it faced initial opposition from vested interests concerned about leakages from the Ministry of Agriculture bureaucracy and some parliamentarians. Despite being extensively discussed in the literature, the role of propitious timing (V9) was not of major importance in this reform.

At the **implementation stage**, the program received one-third of the agricultural budget (V10 – requisite budget), enabling it to thrive and reach nearly one million beneficiaries. However, dysfunctions in program implementation, such as the late delivery of fertilizer for the planting season, emerged due to delayed payments to the government by donors and to discontented private importers by the government (V12 – implementation veto players). Administrative capacity shortcomings also played a role, with local officers of the Ministry of Agriculture stretched thin, spending an estimated 80 percent of their time administering the FISP (V11 – institutional capacity).

Finally, donor and government **evaluations**, media reports, and watchdog groups, all highlighting the lack of impact and high costs of the FSP, helped change the beliefs of key policymakers on its effectiveness (V14). This, combined with rising costs of imported inputs (V15 – changing material conditions) and institutional shifts within the Ministry of Agriculture (V16), informed two alterations to FISP: reducing the volumes of distributed inputs and implementing more targeted approaches. It also led to the adoption of a more cost-effective electronic payment system.

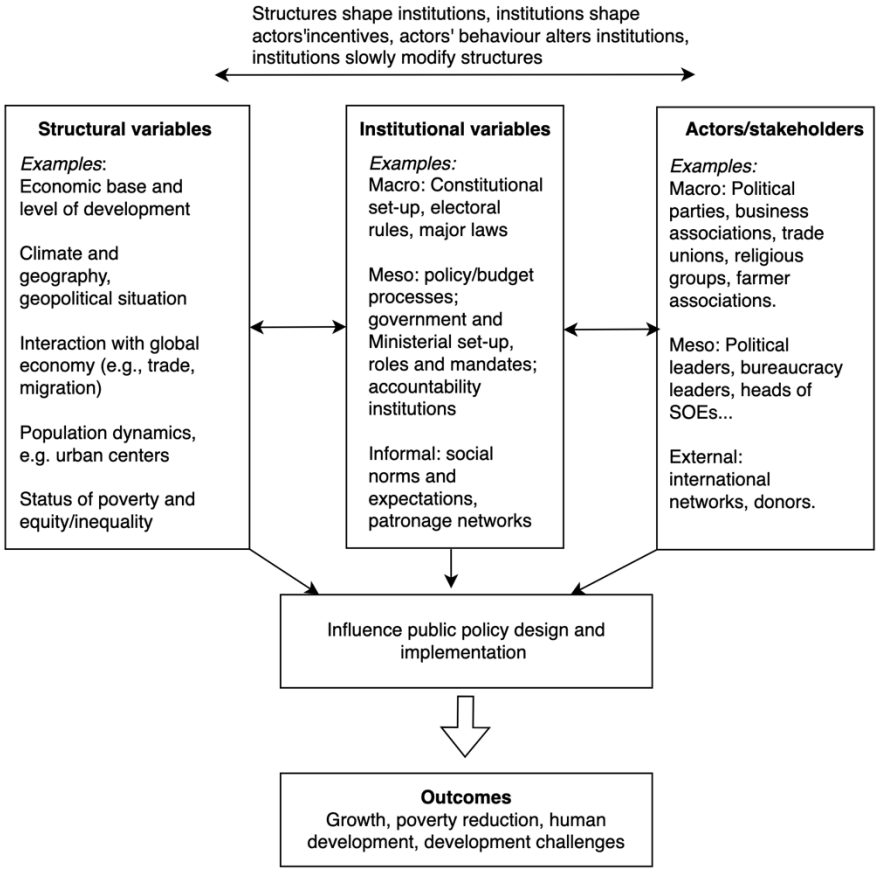
Source: Authors based on Resnick et al. 2018

5.2 PRACTICAL STEPS TO UNDERTAKE POLITICAL ECONOMY ANALYSIS

5.2.1. Introduction: Key Variables and Levels of Analysis

There is a wealth of practitioner toolkits offering guidance on how to implement political economy analysis. Although these documents may vary in approach and methods, they are rooted in similar foundational concepts in political economy literature. These are (a) institutions, (b) stakeholders' power and interests, and (c) structural factors such as macroeconomic, geographical, historical, ideological, and geopolitical parameters (Figure 5.4).[51]

Figure 5.4: Political Economy Analysis Building Block Variables



Source: Adapted from Fritz et al. 2009.

An analytical and practical distinction can be made among the macro, mesa, and micro levels of

[51] The first generation of PEA toolkits tended to rely more heavily on "fuzzy" structural and macro-political and economic factors at the expense of analytical rigor. In second-generation literature, neo-institutionalist economics and rational choice theory were used to add methodological rigor. These emphasized and formalized the role of institutions and economic agents' incentives in shaping policy outcomes, but underplayed the critical role of power imbalances and structural factors. A third generation of approaches has emerged, attempting to synthesize the two (Hudson & Leftwich 2014).

political economy analysis (Figure 5.5). Macro-level political economy analyses focus on country-level parameters, including the following:

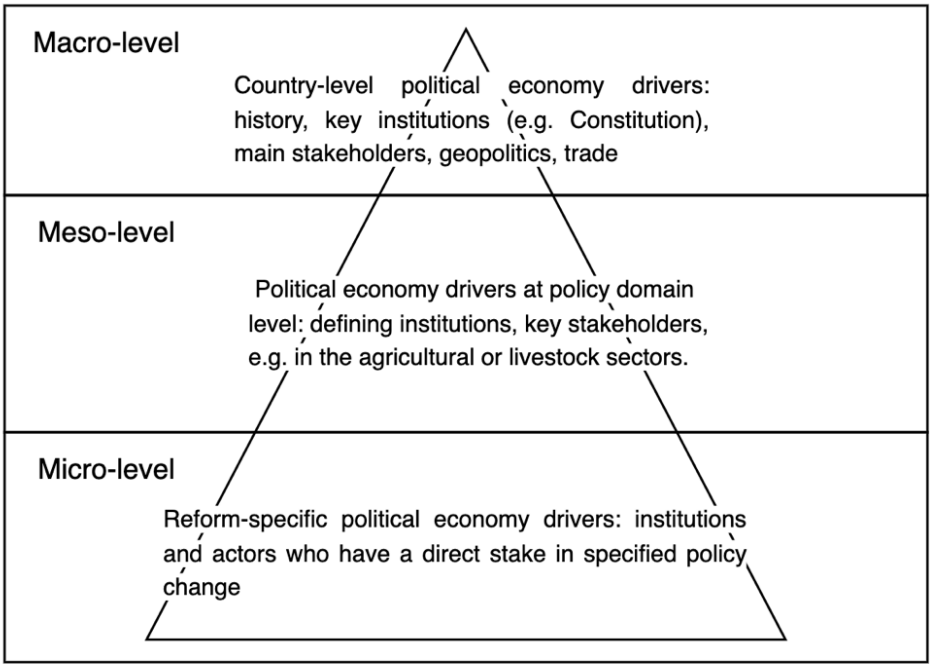
a) The historical trajectory of development that may create path dependencies for policy change;
b) Key *de facto* and *de jure* institutions allocating power and resources between social groups;
c) Ideological, geographic, demographic, global trade, and geopolitical parameters that constrain and condition these institutions;
d) Significant groups that shape and benefit from these institutions at the country level.

This level can provide critical data to inform the political feasibility assessment of broad-based policy changes that would alter the country's political settlement (Warrener 2004).

Meso-level political economy analysis considers political economy variables for narrower "policy domains" (Kelsall et al. 2022) embedded within the macro-level political economy configuration. These domains are characterized by specific institutions and stakeholders with their own internal political economy dynamics, though they are interrelated with the macro-level. Policy domains can be sectoral, such as agricultural or health, or cross-cutting, e.g., land, decentralization.

Micro-level political economy analysis deals with stakes around specific policy changes, for instance, a fertilizer subsidy reform or the introduction of a new irrigation program. Table A.5 presents a list of tools corresponding to each analysis level.

Figure 5.5: The Three Levels of Political Economy Analysis



Source: Adapted from Fritz et al. 2009.

Regardless of the level, political economy analyses can be carried out ex-post or ex-ante. Ex-ante analyses uncover current political economy parameters and can shed light on pitfalls and opportunities for shaping an ongoing or forthcoming reform. Ex-post analyses seek to explain the political determinants of past policy reforms. They can also be useful to inform upcoming reforms.

5.2.2. The Macro Level: Characterizing Country Context

We recommend starting with a review of the political economy literature available for the country under consideration. A rich body of work uses the approaches listed in the annex, especially for developing countries. The London Economist Intelligence Unit publishes frequent and robust political economy notes for most economies worldwide, which can be a good starting point.

This literature can help answer framing questions: (a) What are the general features of the constitutional system? (b) What are the main political parties and their ideological orientation? What role do they play in the political system, and are they linked to ethnic groups? (c) Who are the major political figures in the government, such as the president/prime minister and ministers in charge of economy, finance, and agriculture? What is their background, and for how long have they been in power?

Reviewing key quantitative indicators from international databases can also help characterize a country's governance and economic parameters. Some indicators are suggested in Table 5.2.

Table 5.2: Indicators to Characterize the Country Context

Indicator/Data Source	**Relevance to Agrifood Policy Reform**
Socioeconomic situation, role of agriculture and food security World Development Indicators[52]	
GDP per capita; Growth of GDP	The propensity to support agriculture tends to increase with the level of economic development
Poverty rate	Investment in agriculture is a promising strategy to alleviate poverty
Share of agriculture in GDP Share of agriculture in employment	High shares indicate an opportunity to agriculture, driving economic transformation
Growth rate of agriculture	Low rates indicate a need for agricultural policy reform
Yield gaps	High yield gaps indicate opportunities for agricultural development
Global Hunger Index	High rates indicate a need for nutrition-sensitive approaches
Political regime and administrative capacity Worldwide Governance Indicators	
Voice and Accountability Political freedom	Linked to the ability of stakeholders to actively influence policy processes
Government capacity, control of corruption	Indicator of the government's ability to implement policies
Agricultural governance indicators	Indicator of the government's willingness and capacity to create a conducive business environment for agricultural development
Political commitment to agriculture (for data sources, see the footnote below)	
Agricultural Orientation Index	Indicator of government commitment to agriculture
Share of agricultural expenditure in total government expenditure	Indicator of government commitment to agriculture

[52] For further data source/indicator information, please see the World Development Indicators; https://www.yieldgap.org/; the Global Hunger Index; Worldwide Governance Indicators; agricultural governance indicators; the Agricultural Orientation Index; FAOSTAT for data on share of agricultural vs. total government expenditure; the ASTI Network for spending on agricultural R&D as a share of agricultural GDP; and the MAFAP dataset for measures of subsidization or taxation.

Indicator/Data Source	Relevance to Agrifood Policy Reform
Spending on agricultural R&D as a share of agricultural GDP	Indicator of government commitment to using science and technology to promote agriculture
Measures of subsidization or taxation of agriculture (global dataset), see also the MAFAP dataset (14 African countries), the OECD PSE dataset (OECD economies + 12 other economies), and the IADB dataset (28 countries in America).	Aggregate indicator of the effect of government policies on agriculture

Source: Compiled by the authors.

5.2.3. The Meso Level: Characterizing Food and Agriculture Institutions

A meso-level political economy scan of the food and agricultural sector can complete the macro-level analysis. In developing countries, country-level political economy analyses specific to the agricultural sector are more scarce than those at the macro level.

One valuable source is the series of studies on the Political Economy of Agricultural Policy in Africa (PEAPA) carried out by the Future Agriculture Consortium research project and its successor, the Agricultural Policy Research in Africa. Domestic policy think tanks also frequently publish working papers and policy briefs that address the political economy of agriculture. For example, several African organizations forming the Regional Network of Agricultural Policy Research Institutes (RENAPRI) publish relevant material. RENAPRI is a member of the Innovation Lab for Food Security Policy Research, Capacity and Influence, a global consortium.

The academic literature also contains valuable resources, including studies covering PEAPA,[53] IFPRI research,[54] and political settlement analyses of the agricultural sector in African countries (Box 5.4).[55]

Additionally, analysts can review food and agricultural policies in the country of interest to identify the key institutions that shape the food and agricultural sector. The FAO's Food and Agriculture Policy Decision Analysis (FAPDA) is a useful database for accessing policy documents; it contains over 10,000 national policy decisions and 2,000 national policy frameworks for 100 countries.[56]

This review can be completed by assessing indicators that reflect the orientation of agricultural policies pursued by governments,[57] such as the MAFAP price incentives and public expenditures datasets.

[53] See for instance (Poulton 2014).

[54] See for instance (Birner et al. 2009) on the political economy of agricultural policy reform in India and (Mogues and do Rosario 2015) on the political economy of agricultural public expenditures in Mozambique.

[55] Examples include Booth and Golooba-Mutebi (2014), Whitfield, Therkildsen, Buur, and Kjar (2015), Behuria (2020), Whitfield (2017) and a forthcoming book by Atela and Mustapha (2022).

[56] http://www.fao.org/in-action/fapda/fapda-policy-database/es/

[57] Food and agriculture policy strategies, in particular, tend to be resource mobilization devices with numerous goals, making it challenging to discern the government's actual priorities.

Box 5.4: Macro- and Meso-level Political Economy in Tanzanian Agriculture: Analyzing Rice Policy Implementation

In their book The Politics of African Industrial Policy, Whitfield et al. (2015) analyze the distribution of political and economic power and interests between elite groups and their lower-level factions to explain industrial policy reforms' adoption and implementation trajectories in Ghana, Mozambique, Tanzania, and Uganda.

Among other case studies, they use political economy analysis to explain the implementation failure of two major policy reforms aimed at boosting domestic rice production in Tanzania. The first one is a large irrigation component for rice under the Agricultural Sector Development Program in the early 2000s. The program aimed to increase irrigated land area from 20,000 to 1 million hectares and enjoyed high-level political support from President-elect Jakaya Kikwete and the Minister of Agriculture, Joseph Mungai.

Yet, after five years of implementation, Tanzania had less land under irrigation than before the program launch. Looking beyond technical explanations, the authors show that local authorities, politicians, and donors were interested in using the public resources allocated for the program to build short-term new irrigation schemes instead of investing in "invisible" operations and maintenance for the deteriorating existing network.

In addition, local politicians used the money available for the schemes to allocate rents to local-level elites that could support CCM, the ruling party, for instance, through uncompetitive sub-contracting and procurement. This resulted in under and dysfunctional delivery for the new schemes. The central elites of CCM tolerated this approach, as it was seen as strategic to ensure their re-election by mobilizing rural votes through co-opted regional elites. The CCM did not consider the resulting lack of irrigation benefits for small-scale rice producers to be a political risk. The producers were scattered and unorganized, did not fund the party, nor were they expected to vote for another party due to longstanding CCM allegiance. Finally, rice was not critical for government finances or revenue and could remain under-productive as long as imports could ensure urban food security.

On the other hand, this very objective became compromised in 2005, when five countries of the East African Community, including Tanzania, adopted a 75 percent import tariff on rice to protect their farmers. Adopting the tariff was done to align with neighboring countries and in coherence with the political objective of food self-sufficiency. However, it also threatened the ruling CCM party, as it risked causing unpopular food inflation in urban centers shortly before the elections. This was especially true of Zanzibar, where rice imports accounted for a higher share of consumption than on the mainland and where the opposition party, the Civic United Front, was a credible threat. Considering this, the Tanzania Revenue Authority allowed rice imports to go untaxed in Zanzibar before the elections. This unofficial policy had the effect of lowering rice prices in the island while allowing it to serve as a funnel for cheap rice that would be smuggled to mainland urban centers.

Source: Authors, based on Whitfield et al. 2015.

5.2.4 The Micro Level: Political Economy Analysis of a Reform

Micro-level political economy analysis work relies to a great extent on a robust policy stakeholder analysis for a specific reform of interest. A policy stakeholder is "an individual, community, group, or organization with interest in the outcome of an intervention, either due to being affected by it

positively or negatively, or by being able to influence the intervention positively or negatively (DFID 2003a, 2.1). Stakeholder analysis "aims to identify stakeholder characteristics, their interests, and the nature and degree of their influence on existing or future policies, reforms, or interventions" (World Bank 2007: 36).

Various tools have been developed for stakeholder analysis: this section focuses on the Process Net-Map, and Table A.5 lists other tools.

Process Net-Map is based on the Net-Map, a participatory mapping tool developed by Eva Schiffer.[58] Net-Map helps to provide information on the following questions:

- Which stakeholders can influence a particular outcome? e.g., a policy reform such as repurposing an agricultural input subsidy program
- What types of linkages exist between the stakeholders? e.g., information exchange, formal authority, flows of money, etc.
- What are the interests and positions of these stakeholders regarding the respective reform? e.g., in favor, neutral, opposed
- How much influence do the stakeholders have to promote or prevent this reform?
- What are the sources of their influence?

Policy practitioners, referred to as analysts in this section, can employ Net-Maps during interviews with individual focus groups of key informants to explore a policy reform of interest. Analysts can draw Net-Maps to analyze the political economy of a planned or past policy reform by identifying actors that are expected to influence or have shaped the reform under study.

Applying the Net-Map tool

Analysts need the following equipment to apply the Net-Map tool:

- A large sheet of paper (e.g., a flip-chart paper) to draw the Net-Map;
- Sticky notes in different colors to indicate different types of actors;
- Pens in different colors (e.g., felt-tip pens) to draw the linkages between actors;
- Pieces that can be stacked on top of each (e.g., checkers game pieces) to show the influence level of the actors;
- Optionally, actor figurines (e.g., from board games) that illustrate the actors.

In preparation for a Net-Map exercise, it is important to clearly specify the reform (past or envisaged) to be analyzed. The analyst may draw their own Net-Map of the reform based on their prior knowledge and then pre-test the approach with selected key informants.

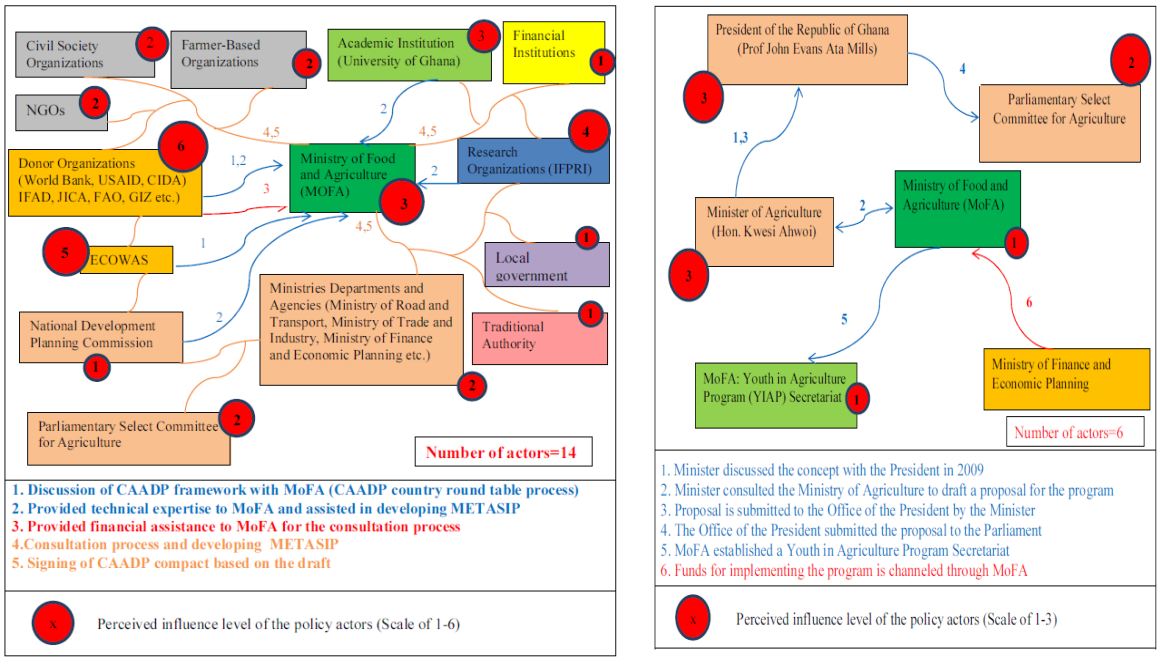
Step 1: Identifying the steps of the process and the actors involved

As a first step, Net-Map analysts specify the policy process to be mapped and its outcome, e.g., passing a law or budget by parliament. Figure 5.6 displays two policy processes mapped by (Mockshell and Birner 2016) in their Net-Map case study of Ghana's agriculture policy reforms. One policy process, displayed on the left-hand side of the figure, is the development of Ghana's Medium Term Agricultural Sector Investment Plan (METASIP). The other policy process, displayed on the right-hand side of Figure 5.6, refers to the development of the Block Farms Program. This national policy initiative subsidized

[58] More detailed information is provided at the Net-Map website by Eva Schiffer, a Net-Map Manual (Schiffer 2007) and a Net-Map Training slideshow (Schiffer 2008).

the provision of inputs and mechanization services to youth groups who jointly cultivate blocks of land.

Figure 5.6: Process Net-Map of Agricultural Policy Processes



Source: Mockshell and Birner 2016.

Analysts leading the Net-Map exercise begin by asking respondents to identify key milestones in the policy process under study and what policy stakeholders contributed to it. Each milestone is numbered, and numbered arrows connecting the actors identified reflect their involvement in these milestones. Analysts can use different colored arrows to distinguish activity types in the process, such as holding consultations or providing funds.

Step 2: Identifying actors' influence levels

The analyst then asks the respondents to rate the influence level of the different actors on the reform outcome, using a scale defined by the analyst, e.g., from zero to six. If few actors are involved, as in the Block Farms Program (see right-hand side of Figure 5.6), the analyst can use a different scale, e.g., from zero to three. As described above, checkers' game pieces are used to visualize the influence levels of the different actors. This provides an opportunity to discuss the underlying reasons for the different actors' influence.

Step 3: Using the Process Net-Map to discuss strategies for policy reform

The last step in applying Process Net-Map is conducting a participatory map analysis with the respondents. Analysts can draw Process Net-Maps of past policy processes to inform future reforms. Guiding questions could involve the following:

a) What were the major bottlenecks in the process?
b) How were they overcome?
c) What was the role of the different actors in overcoming the bottlenecks?
d) How did the process influence the subsequent implementation of the policy?
e) Where are the best entry points to engage in the policy process?
f) What helped to create windows of opportunity for reform?

For instance, the Process Net-Map displayed in Figure 5.6 reveals important differences between the two policy processes in Ghana. The METASIP process was more inclusive, involving a wider range of stakeholders. In contrast, the policy process that led to the Block Farms Program involved fewer but highly influential actors who were not part of the METASIP process. Most notably, this included the President of Ghana and the Parliamentary Select Committee on Agriculture. The discussion with the participants of the Process Net-Map exercise revealed that the Block Farms Program had a stronger political coalition for implementation than METASIP due to the involvement of more influential actors and the strong alignment with their policy beliefs.

CONCLUSIONS AND KEY TAKEAWAYS

One of humanity's greatest challenges is providing nutritious and healthy food to a growing population, estimated to reach around 10 billion by 2050. This must be achieved while addressing the challenges of climate change and without worsening the issue or degrading natural resources further. Our current agrifood systems are inadequate and incur significant social, economic, and environmental costs. Addressing these challenges requires a comprehensive strategy that operates on multiple fronts, contributing to the triple bottom line of promoting healthy people, a healthy planet, and a healthy economy.

Building better agrifood systems requires tackling multiple distortions that impede the development of robust and efficient agri-food value chains, generate harmful externalities, and waste critical resources such as water and energy: low agricultural productivity; degradation of natural resources; vulnerability to weather and climate variation; policy and regulatory distortions that result in imbalanced production of certain commodities and overuse of harmful inputs; high rates of food loss and waste, etc. Maximizing the “triple-wins” from the agri-food system (i.e., higher productivity and incomes, greater resilience and reducing its environmental footprint) is a complex and multi-faceted challenge, with potentially non-trivial tradeoffs.

At the core of finding viable solutions is identifying if the existing agricultural policy support provides the appropriate incentives to make appropriate decisions towards achieving the triple-wins. Agricultural policy support takes multiple forms which may require public budget outlays. It includes investment in much needed public goods (such as research and advisory services, public infrastructure, and food safety and standards) and subsidies to agricultural producers.

Successful transformation of the agrifood system will require providing the correct incentives to economic agents across the system. Public policies and programs primarily determine incentives, and it is clear that our current support to the sector is mostly through instruments that are distortive and provide incentives for unsustainable production and consumption patterns in the food system, resulting in inefficiencies and large externalities. However, removing support from the agriculture sector is not the solution: research shows this has important trade-offs. Cutting an incentive or subsidy can result in lower production, one of the major concerns of policymakers prioritizing food security. Policymakers now face a core question: how can we repurpose this support to yield sustainable productivity growth in agriculture, deliver better climate outcomes, and make healthier diets more affordable for poor consumers to achieve better food and nutrition security?

Global analysis shows that the most effective strategy is repurposing a proportion of the current agricultural support toward innovation and technology, specifically targeting emissions reduction and higher productivity. This approach harmonizes with the triple bottom line and avoids costly trade-offs. Implementing such a repurposing agenda requires country-specific actions, including identifying distortive subsidies and options for repurposing. Countries can explore various repurposing options, including phasing out production-coupled support and introducing decoupled support like income transfers or payments for ecosystem services. Shifting support away from recurrent expenditures towards fixed capital formation, such as variable input subsidies, can enhance productivity. Improving the delivery mechanism of support to enhance targeting and reduce the unsustainable use of input factors is another option, as is redirecting a portion of the support towards providing public goods and services, such as research and extension. However, there is no one-size-fits-all solution; the key is adapting the type and extent of repurposing to each country's specific development challenges and goals.

Measuring the current extent and nature of agricultural support is a crucial first step in this process. This toolkit, designed for a diverse audience, including policymakers, agricultural experts, environmental advocates, and community leaders, offers a comprehensive framework for this analysis. Each user group is encouraged to leverage the insights and methodologies provided to tailor their strategies to local contexts and challenges. Agricultural experts and practitioners can use detailed case studies and methodologies to develop more sustainable agricultural practices. Environmental advocates can find valuable data and arguments to support their advocacy work. Community leaders can use the information to engage in informed dialogue with policymakers and other stakeholders, advocating for changes that benefit their communities.

The value of this toolkit lies in its comprehensive approach to repurposing agricultural support. It bridges the gap between theoretical policy discussions and practical, actionable strategies. The toolkit equips users with the tools they need to make informed decisions and implement effective changes by combining in-depth analysis, case studies, and clear methodologies. It addresses a critical need in agricultural policy reform by offering evidence-based solutions that align with economic, social, and environmental objectives, boosting the global effort to create more sustainable and equitable food systems.

Setting the Repurposing Agenda

Effective repurposing of agricultural support begins with a thorough understanding of the country's economic context and policy landscape, clarifying development objectives. This includes examining policy coherence with developmental objectives to identify areas for reform. Policy dialogue is a critical tool to help set the repurposing agenda and encompasses three relevant notions. It is (a) a platform for knowledge exchange between evidence providers and policymakers, (b) a state governance mode, and (c) a negotiating instrument for non-state actors. Since policy dialogue is often not evidence-based, the toolkit provides strategies to ensure that policy dialogues are grounded in evidence, enhancing the decision-making process.

Agricultural Policy Support

A comprehensive analysis of the broad range of public policies governing the agricultural sector is the first critical step for informing any repurposing action. This includes reviewing public expenditure and price incentives to understand this support's type, nature, and trends. Among the various methods available to measure and analyze public policies, the one adopted by FAO is particularly detailed and modular in its implementation, i.e., the scope of the analysis can be defined on a case-by-case basis and tailored to the developing country's context.

The FAO/MAFAP methodology outlines as approach to capture agricultural policy support building off the methodology proposed by OECD. MAFAP approach is more suited to the developing country context and is more comprehensive and broad capturing not only agriculture specific expenditures but also agriculture supportive expenditure. Public expenditures at both national and subnational levels, if possible, are analyzed based on their function and by economic, administrative, and sectoral classification where data allows. A key advantage of the approach is also its modular nature allowing the user to select specific components as required for the analysis .

Price incentives analysis complements the public expenditure review by offering insights into how policies, mainly on trade and markets, affect incentives in the agricultural sector. Analysis of indicators such as the NRP, NRA, or the market development gap provides a more comprehensive understanding of how government policies (or lack of policies) impact incentives to produce, commercialize, and consume agricultural commodities.

Impact Evaluation

Evaluating the potential impact of policy change is essential. This toolkit advocates for a combination of analysis methods. Firstly, general equilibrium analysis is mostly used to evaluate the *ex-ante* impact of policies on multiple objectives.[59] These include synergies and trade-offs among various objectives, such as environment, agricultural productivity, and poverty.

In addition to general equilibrium analysis, analysts can also conduct a complementary ex-post micro-level analysis to assess the incidence and efficiency of the different instruments used by the government. The most appropriate econometric tool to deploy depends on the research question, outcomes of interest, availability of data, and the time available for the analysis.

Political Economy Analysis

Even the most well-designed and well-intentioned policy reforms can face political face barriers. Therefore, once the repurposing agenda has been established, it is important to analyze the political economy to develop a plan to help ensure the agreed-upon agenda is adopted. There are three main approaches to such analysis: stakeholder analysis, institutional analysis, and joint stakeholder-institutional analysis.

Overcoming resistance to agricultural policy reform from affected stakeholders can be a huge challenge. Identifying the winners and losers of the repurposing options and the potential societal gains is important. Engaging with multiple stakeholders to discuss the potential trade-offs associated with policy options and to devise acceptable strategies should help to earn political support for the smart repurposing of existing support at the national level.

[59] Note that CGEs can also do an ex-post analysis of policies by departing from a base scenario that includes the policies and comparing this to a counterfactual that has removed the policies.

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APPENDIX: TERMS OF REFERENCE FOR STUDY ON REPURPOSING AGRICULTURAL SUBSIDIES

The following Terms of Reference may be used when hiring a consultant to analyze repurposing agricultural support; this includes five activities, as follows:

(i) Providing an overview of national policies relevant to repurposing agricultural support in the country of study
(ii) Gathering data and calculating measures of PE on agriculture
(iii) Gathering of data and calculation of PIs facing the agricultural sector
(iv) Modeling the repurposing of agricultural support to assess synergies and trade-offs
(v) Compiling a report with the results of these four activities.

COUNTRY-LEVEL STUDY ON REPURPOSING AGRICULTURAL SUPPORT

Terms of Reference (TOR) ***(template)***
(replace or remove any terms or phrases written in black in bold italics)

Objective

There is an urgent need to transform the agrifood system. Doing so can result in multiple gains, including higher productivity and incomes, reduced poverty, and a lower environmental footprint. Finding viable solutions to the challenge of supporting agricultural development requires addressing whether the current support provided to agricultural producers creates the appropriate incentives to encourage decisions that help achieve such triple wins. In many cases, there is a need to repurpose existing support to agriculture so that it aligns with the desired development goals set by the international community, national governments, or interest groups.

This work is part of _____***insert name of organization***_____ efforts to support the Ministry of Agriculture of the Government of _____***insert name of country***_____ with evidence-based planning for improving the performance of the agricultural sector. The objective is to assist the government in making better-informed decisions to improve agricultural sector growth, raise incomes, increase resilience, and reduce agriculture's environmental impact.

Repurposing a country's agricultural support requires a comprehensive overview of its agricultural policies. This includes a review of that country's agricultural and rural policy frameworks, a description of the level and composition of public expenditures on agriculture (PEA), and a description of price incentives in the sector. It is also crucial to model the impact of select policy reforms on various objectives, including trade-offs, in how they impact those objectives. This TOR is for a consultant to produce such a comprehensive overview.

The TOR is composed of four activities:

Activity 1: Overview of agricultural policies and key commodities **(10 days)**
Activity 2: Review of PE on agriculture **(20 – 30 days)**
Activity 3: Review of price incentives in the agricultural sector **(20 – 30 days)**
Activity 4: Evaluating Trade-offs and Options: Country-level modeling **(20 days)**
Activity 5: Final report combining the above analysis **(10 days)**

The _____***insert name of organization***_____ team seeks a consultant for the duration of ***80 – 100 working days*** to support activities 1 - 4.

Scope of Work

Activity 1: Overview of agricultural policies and key commodities

Rapid country scoping report.

This task consists of collecting detailed country-level information and key indicators on policy, environmental and support programs needed to estimate the model described in Activity 4. In the agricultural sector more specifically, it will do the following:

a) Based on data availability, identify key commodities of interest (whether farmed by people with low incomes or not), the share of agricultural value added the commodity represents, and the share of the population engaged in their production;
b) Consult existing AgPER analyses to review public support programs in agriculture and the wider food system[60];
c) Produce a detailed policy inventory covering both policies *in* the agriculture sector and supportive policies *for* the agriculture sector through other sectors;
d) Note suggestions for policy reform; these may arise in consultation with stakeholders or while reviewing documentation;
e) Present a report to the FAO and in-country team for agreement on key commodities and key policies of interest and discussion of possible policy reforms.

Activity 2: Review of PE on agriculture

In particular, the consultant will perform the following tasks in relation to PE analysis:

a) Uptake MAFAP PE methodology through the available capacity development material and brief on-the-job training sessions;
b) Collect off-budget and on-budget expenditures, including subnational expenditures, for 2017/18 (both actuals and budgeted). Preserve as much of the original information for each line item as possible in the data sources, i.e., unique line item code, name and code of the project and the spending unit, COFOG, and GFS classifications, if available. Provide a written assessment of data quality, and main gaps and limitations;
c) Collect relevant supporting documents, such as the Farm Input Subsidy Programme report 2017/2018, maize procurement report, total budget reports, and treasury confirmation to support expenditures classification and analysis of the indicators;
d) Review and validate the classification of the updated dataset and perform a results consistency check;
e) Contribute to and review a short analytical report condensing the main findings of the PE indicators update, including policy implications and recommendations to improve the composition and efficiency of PEA in _____***insert name of country***_____.

Activity 3: Review of price incentives in the agricultural sector

Collect price data at the border, farm gate, and in wholesale where applicable. Collect market access costs and production and trade information for 2018 for the agreed-upon commodities, mainly from agreed-upon institutions.

Using the collected data, calculate selected indicators of PI to farmers, including the following, if possible:

- The NRP

- The NRA
- The MDG

Submit the required data in the agreed-upon template, including a brief written assessment of data quality, gaps, limitations, and any changes from the last year they were collected.

Activity 4: Evaluating trade-offs and options: Country-level modeling

To analyze impacts of current and potential policies, a comparison of current and projected outcomes is necessary, considering costs and benefits. This analysis must consider a general equilibrium global model to account for the economywide effects of economic policies. The model should also include key outcomes of interest, such as economic, equity, nutrition, resilience, and environmental impacts, including GHG emissions. The model should also account for interactions and reactions of other individual countries around the world. The consultant will first calibrate the model using the information gathered through Activity 1: the detailed country-level information and key indicators on policy, environmental, and support programs. Finally, the consultant will use the model to assess the effects of reform options, including trade-offs and synergies, and aid policymakers in evidence-based decision-making.

Activity 5: Final report

Compilation of shortened reports from Activities 1–4.

III. Work Plan and Deliverables

The following timelines correspond to the consultant's work plan, assuming the required days are the maximum from the range provided above.

Due Date	Tasks	Main Deliverables
(_amend date as necessary_) (10 working days after start)	Rapid country scoping report as described above.	Activity 1: Report delivered.
(_amend date as necessary_) (30 working days)	PEA as described above	Activity 2: Report delivered
(_amend date as necessary_) (30 working days)	Analysis of price incentives	Activity 3: Report delivered
(_amend date as necessary_) (20 working days)	CGE modeling of policy impacts, synergies, and trade-offs	Activity 4: Report delivered
(_amend date as necessary_) (10 working days)	Final report	Activity 5: Final report delivered.

IV. Required Qualifications

The consultant must have at least a Master's Degree in agricultural economics or similar discipline, though a PhD. is preferred). The consultant is expected to have at least ten years of experience in agricultural policy research in developing economies, focusing on PE. Previous experience leading or providing substantive contributions to PEA is essential, ideally in the agricultural space. Knowledge of existing relevant data sources is an advantage. The consultant must be flexible with a demonstrated ability to collaborate as part of a multidisciplinary and multicultural team across different time zones. The consultant should be comfortable engaging with senior government officials and experienced with organizing and presenting stakeholder workshops. They must be fluent in English.

V. Contacts at _____*Insert name of organization*_____

The contact person for this assignment is _____***insert name***_____ at _____***insert email***_____.

ANNEX

Table A.1: Key Barriers and Enablers for Evidence Demand and Supply in Repurposing Policy Dialogue

	Evidence demand (e.g., policymakers)		Evidence supply (e.g., research organizations, donors)	
	Barrier	**Enabler**	**Barrier**	**Enabler**
Capacity	• Low financial and human resources to access and process evidence • High opportunity cost of going through the evidence and its policy implications	• Building capacity for policy dialogue participants on understanding research results	• Low credibility and legitimacy, e.g., lack of country presence, lack of trusted relationship with decision-makers and communities, low context-specific expertise, low commitment to the policy agenda	• High country presence, frequent and sustained interfacing with policy stakeholders, co-production of knowledge, country-specific evidence
Institutional	• Distrust of evidence as an input for policymaking • Low accountability of public policy • High turnover of decision-makers and short time horizons for initiating reforms • Disincentive to adopt evidence-informed reforms that can be financially/politically costly	• Increasing accountability of policymakers to citizens • Including a diversity of players in the policy dialogue, including lower-level bureaucrats that are more likely to survive political turnovers • Identifying politically acceptable reform solutions • A good understanding of the institutional landscape, evidence tailored to the relevant audience and communicated at the right time	• Lack of incentives in engaging policy stakeholders on reform processes after the production and delivery of evidence • Lack of knowledge of policy processes and public administration	• Encouraging policy engagement beyond the production of evidence or working through evidence brokers and champions • Recruiting political scientists, policy studies and/or public administration specialists
Discourse and communication	• Policymakers using a different language from evidence suppliers, expecting clear-cut and unambiguous policy solutions	• Nurturing a sustained dialogue between suppliers and users to build a common language around the evidence	• Use of overly technical, risk-averse and probabilistic research language • Lack of a persuasive, storytelling approach to evidence communication • Results that confirm common sense knowledge are expected; a lack of actionable recommendations • Overly long and visually unappealing presentation of results	• Using storytelling techniques, emotional appeals • Offering actionable recommendations that are new solutions to contested/hot problems • Making sure policy solutions improve on the status quo • Rooting findings in the local context • Good communication strategy, with target audiences and media

Political economy	• Policymakers using evidence tactically to support prior policy positions defined by political interests (e.g., cherry-picking, symbolic use of evidence)	• Betting on the long-term influence of evidence over policy reform decisions, e.g., through the cumulative effect of evidence used in multiple dialogue avenues	• Production of politically loaded evidence (e.g., commissioned by policy players with a stake in the reform)	• Independence from political pressure to increase the legitimacy of evidence

Source: Authors' own elaboration

Table A.2: Mapping a Subsidy Reform with the UIF: Factors and Key Questions

Domain	Factors	Relevant Questions
1. Resource	1.1 Budget	• Are resources available to provide the amount of fertilizer needed under this policy? • Can the fertilizer be distributed reliably and at a reasonable cost? • Does the subsidy rate account for farmers' transportation costs? If not, what impacts would an increase in the subsidy rate have on overall implementation costs? • Is business credit available to private input suppliers?
	1.2 Human resources	• Do agriculture extension agents and other district-level actors have the resources to carry out implementation responsibilities, e.g., enforcing targeting requirements?
	1.3 Infrastructure and physical resources	• To what extent can the existing infrastructure/network of agri-dealers support fertilizer delivery to smallholders, including those in remote areas?
2. Planning and coordination	2.1 Targeting	• What methodology will be applied to identify and reach targeted beneficiaries, e.g., low-income farmers? • Will different farmers or areas have differentiated fertilizer needs based on soil characteristics?
	2.2 Guidelines and documentation	• Are there clear guidelines/procedures for payments to fertilizer suppliers?
	2.3 Management and coordination	• What established institutional mechanisms coordinate key implementation steps, such as fertilizer procurement and distribution? • Does the lead implementing agency have the means to oversee targeting, procurement, and distribution? • Are implementation roles and responsibilities clearly specified across government agencies and private sectors, where applicable? • Is the fertilizer supply chain well-coordinated? • Is there an opportunity and benefit to expanding the private sector's role in fertilizer distribution?
	4.3 Policy alignment and sequencing	• How does the fertilizer subsidy policy interact with existing policies focused on developing fertilizer markets? • What implications do existing trade policies have for importation of fertilizers under the subsidy program?
3. Leadership and ownership	3.1 Public sector champions	• Who are the policy's champions at the community, district, or regional levels? What support do they need to be effective?
	3.2 Inclusive stakeholder engagement	• What forums exist for policy dialogue between government and key stakeholder groups (e.g., farmers, agri-dealers, and fertilizer associations)?
	3.3 Education, messaging, and awareness	• Have provisions been made to socialize extension agents to the purpose and modalities of the subsidy? • What communication channels are in place to ensure farmers have the information needed to access the subsidy?
2 Measurement and accountability	4.1 Monitoring systems	• Does the fertilizer subsidy policy have a time-bound monitoring plan? • Does the plan specify reporting requirements and relationships? • What systems are in place to verify key steps, such as importing, distribution, and beneficiary selection? • Do responsible entities have the capacity to perform this auditing function? • How will government assess the quality of fertilizer supplied to farmers?

		4.2 Transparency and public access to information	• Does the policy's monitoring plan envision a role for farmer organizations, agri-dealers, or community groups in monitoring implementation? • To what extent can such groups access the information needed to monitor implementation? • How can mobile phone technology be leveraged to facilitate farmers' access to information about the subsidies?
		4.3 Institutional accountability	• How much discretion do implementing agents have to divert subsidized fertilizer from intended beneficiaries? How can such interventions be mitigated?
3	Political economy	5.1 Power incentives and institutional norms	• At what implementation points are politically-motivated benefit leakages most likely? • How might the policy's stated or implicit political objectives impact the effective targeting of the subsidy? • How can pressures for the perpetual continuation of subsidies be countered to improve sustainability?
		5.2 Political priorities	• How vulnerable is the policy to a change in the country's political leadership and change at lower levels of government?

Source: Urban Institute 2022.

Table A.3a, 3b: Agriculture-Specific Expenditure Classification

3a. PEs that directly benefit agents in the agriculture sector

Category	Subcategory	Definition	Example
Transfer to Producers	Production Subsidy based on outputs	Based on the production of a particular product or group of products (animal heads) Support is implemented based on price, tonnes produced, or planted area	Deficiency payment
			Payments by cultivated area or type of maize variety
	Input subsidies • Variable Inputs • Capital • On-farm services	Government policy that supports farmers reduces the cost of inputs necessary for the agricultural production of crops or animal products	Subsidies for fertilizer, seeds, pesticides, machinery, or other equipment
	Income Support	Direct subsidy to the producer, normally granted regardless of production level	Based on current revenue/ overall farm level of income
	Other Support	This category is used when information to allocate them into another category is insufficient	
Transfer to Consumers	Food Aid	Transfers granted through the subsidy for food consumption	Food stamps; distributing government stocks to reduce food costs
	Cash Transfers	Transfers granted to consumers aimed to increase their purchasing power for food by increasing expenditures on food consumption	Direct payments to consumers through cash, vouchers, etc.

	School Meals	Transfers to consumers through school feeding programs or similar	School breakfast in rural areas
	Other payments to consumers	Other support not included or without classification	
Transfer to Other Agents	Input suppliers Processors Traders Transporters	Monetary transfers to individual agents	

3.b. PEs that collectively benefit the agriculture sector rather than a specific agent

Category	Subcategory	Definition	Example
Transfer benefiting the sector collectively	Agricultural Research	Transfers for R&D of products, inputs, techniques, etc., to improve agricultural production in the sector. Includes services for technology generation and innovation (scientific, institutional, etc.)	Spending on National Institutes of Agricultural Research
	Technical Assistance	Transfers for an integral accompaniment of specialists in productive projects of the agriculture activity. Such transfers allow farmers to strengthen their productive, commercial, and management capacities to collectively guarantee their growth and competitiveness.	Production techniques, business plan elaboration, pesticide control, and conservation programs
	Training	Transfers for training advice for producers	Demonstration plots, courses, workshops, conferences, and demonstration events
	Extension Services	Educational services, partnered with farmers, are responsible for directing programs and projects for change	Trainings on Integrated Pest Management and soil health,
	Inspection	Transfers that finance activities related to agricultural product safety and control that benefit primary agriculture but not individual farmers	Pest and disease inspection and control, agricultural product safety, inputs, and environment
	Agricultural infrastructure (feeder roads; off-farm irrigation)	Transfers for developing or maintaining agriculture infrastructure or roads that provide easier access to plots of land or cultivated areas	Irrigation and drainage networks, off-farm irrigation, harbor facilities, and rural roads
	Storage/public stockholding	Transfers to finance investments to off-farm storage and other market facilities costs	Grain storage warehouses, silos
	Marketing	Financing assistance for the marketing of food and agricultural products	Marketing assistance, wholesale markets, futures markets, price, and market information
	Other	Other support benefiting the agrifood agents collectively	

Table A.4 presents PEs aimed to develop rural localities and populations, to increase their living standards.

Table A.4: Rural Support Expenditures Classification

Category	Subcategory	Definition	Example
Rural Infrastructure	Rural Education	Public expenditures on education in rural areas	Public schools
	Rural Health	Public expenditures on health services in rural areas	Public local hospitals
	Rural Roads	Public expenditure for construction and maintenance for rural roads	Maintenance and construction of rural roads, temporary employments
	Water Sanitation	Public expenditures financing rural water and sanitation or management systems, aimed at ensuring rural access to clean water, adequate sanitation, and health services	Water quality, clean water
	Energy	Public expenditures financing rural energy, or services such as energy	Hydro-energy, energy saving in greenhouses
	Others	Other support not included	

Table A.5: Selected PEA Tools and Approaches

	Name of tool	Main user	Brief description
Macro/country-level	DFID Drivers of Change	DFID/FCDO	A conceptual model seeking to explain how pro-poor change arises due to the interaction between structures, institutions and agents
	Strategic Governance and Corruption Assessment (SGACA)	The Netherlands, Ministry of Foreign Affairs	A conceptual framework similar to Drivers of Change, but more strongly embedded in the Embassy's planning process
	Power analysis	Sweden International Development Agency	Similar to above, but a central focus on analyzing the nature of power relations. Key questions are where does real power lie, how it is distributed, who is excluded, and what are the incentives for pro-poor reforms?
Meso/policy domain level	Analytical Framework for Understanding the Political Economy of Sectors and Policy Arenas	DFID/Overseas Development Institute	Includes: (a) sector mapping, (b) sector political analysis, (c) how players influence the policy process, and (d) operational implications
	Addressing Governance in Sector Operations (EC)	European Commission	Includes: (a) analysis of sector context, (b) mapping of interests, power and incentives for various actors, (c) analysis of governance and accountability relations, and (d) analysis of governance reform readiness
Micro/policy issue level	World Bank - Problem-driven Governance and PEA World Bank - Political Economy of Policy Reform	World Bank	A varied set of tools focused on analyzing interests, incentives and institutions bearing on a particular policy or operational problem.
	Net-Map, Process Net-Map	IFPRI	An approach focused on stakeholder network mapping, considering power, interests, and worldviews. Can be combined with content analysis to elicit the role of ideas and narratives
Cross-cutting tools and approaches	Thinking and working politically (TWP) and Everyday Political Economy Analysis (EPA)	A community of policy practitioners and governance researchers, including Overseas Development Institute, World Bank, OECD, FCDO	The core idea behind the TWP and EPA approaches is that PEA principles—that politics matter and flexibility and adaptability are key—should be ingrained in the day-to-day ways of working of policy practitioners
	Oxfam's PEA guidebook	Oxfam	An approach that can be tailored depending on macro, meso or micro questions: mapping and analyzing (a) stakeholders' interest and influence, (b) institutions, and (c) values and ideas

	ESID's Adjusting and Scaling PEA	Effective States and Inclusive Development (University of Manchester)	Three types of PEA analysis, depending on the objective of the PEA: (a) agenda-setting analysis to create a shared understanding of PEA, (b) problem-solving analysis to identify and remove bottlenecks, (c) influencing analysis to develop a strategy for policy change. Three intensity levels are proposed: a 1-hour conversation, a one-day workshop, and a 1-month report.
	World Resource Institute's Guide to Assessing the Political Economy of Domestic Climate Change Governance	World Resource Institute	The framework focuses on analyzing the usual building blocks of PEA: structure, institutions, and stakeholders, but emphasizes the role of ideas and narratives. It also requires exceptional precision in the assessment questions to be answered for each variable.

Source: Adapted and updated from Unsworth and Williams 2011.